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A NEW OBJECTIVE METHOD FOR SHOWING SPECIAL RELATIONSHIPS

BY

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AS LONG ago as 1889, the British anthropologist, E. B. Tylor, called attention to the growing need of more exact methods for treating cultural data. In the *Journal of the Royal Anthropological Institute*, Vol. 18, page 245, he writes,

> For years past it has become evident that the great need of anthropology is that its method should become strengthened and systematized.

Revolutionary changes have come about in ethnological thinking, since Tylor's day. New theories, new concepts, and painstaking field studies have radically modified our ideas of culture processes in the last decade, and ethnology has consistently tended to become more and more objective. Yet, it is a truism that in every science there is always room for further refinement of method. Accordingly, the writers believe that the method which forms the subject of this paper is a further step toward that purely objective treatment of data which is so desirable.

Before proceeding with the detailed explanation of the method, it may be well to say a few words regarding our preliminary work. The process was developed in our seminar under the direction of Professor A. L. Kroeber of the University of California. Early in the work of the seminar, we took up for discussion a recent monograph by Ralph Linton on "The Material Culture of the Marquesas Islands," *Memoirs of the Bishop Museum*, Vol. 8, No. 5 (1923). In this monograph (pp. 449-457) Linton gives a comparative table of the material culture of six Polynesian groups: the Marquesas, New Zealand, Hawaii, the Society Islands, Samoa, and

Tonga. From the first, this table engaged our attention and we endeavored to adduce independent ethnological conclusions from it. It was soon apparent, however, that ordinary methods in the hands of persons not specialists in the Polynesian field were quite inadequate to cope with the material contained in the table. Accordingly, we turned to statistics for aid in the hope that some satisfactory means could be discovered of correlating the mass of tabulated data. In this hope we were not disappointed, and the method outlined below is the result of our work. During this phase of our task we were ably advised by Dr. Raymond Franzen of the Education Department at the University of California, and wish to take this opportunity of expressing our appreciation for his generous co-operation.

The process which we finally adopted and applied to the data is an extension of the well known "mean square contingency" method of correlation and gives its results in terms of probabilities. The detailed explanation of the process which follows will show exactly how it is to be applied.

In its original form, Linton's table was unsuited for our treatment and we were obliged to modify it accordingly as will be explained.

The following is our modification of Linton's table (pp. 449-457 in his book.)

TABLE I

		M.	N.Z.	H.	Soc. I	S.	T.
1.	Platform present	1	0	1	1	1	1
2.	Platform constant	1	0	1	0	0	0
3.	Platform rare	0	0	0	1	1	1
4.	Platform rectangular	1	0	1	1	0	x
5.	Platform oval	0	0	0	0	1	x
6.	Shape rectangular, house	1	1	1	1	0	0
7.	Shape oval, house	0	0	0	1	1	1
8.	Shape round, house	0	1	0	0	1	0
9.	Ridge pole	1	1	1	0	1	0
10.	End posts	1	1	1	1	0	0
11.	Indirect ridge pole	0	0	0	1	0	1
12.	Rigid triangular support	0	0	1	0	0	0
13.	Three posts in center and apse	0	0	0	0	1	0
14.	Entrance, end	0	1	1	0	0	0
15.	Entrance, side	1	0	1	1	1	1
16.	Door, wooden slide	1	1	0	0	0	0

		M.	N.Z.	H.	Soc.I.	S.	T.
17.	Door, mat	1	0	0	0	0	1
18.	Interior permanent division	1	1	1	1	0	0
19.	Ornamental lashings	1	0	1	1	1	1
20.	Carved posts	1	1	0	0	0	0
21.	Carved panels	0	1	0	0	0	0
22.	Woven panels	0	1	0	0	0	0
23.	Painted rafters	0	1	0	0	0	0
24.	Stools	0	0	1	1	0	0
25.	Soft Pillows	1	1	1	0	0	0
26.	Wooden pillows	1	1	0	0	0	0
27.	Legged pillows	0	0	0	1	1	1
28.	Store house on posts	1	1	0	1	0	x
29.	Men's house on posts	1	0	1	0	0	0
30.	House decoration	1	1	0	0	0	0
31.	Sacred house, high roofed	1	0	0	0	0	0
32.	Sacred house, like dwelling	0	1	1	1	1	1
33.	Sacred house, tapa, pyramid	0	0	1	0	0	0
34.	Canoes, five pieces	1	1	1	0	0	0
35.	Canoes, dugout	1	1	1	0	0	0
36.	Plank canoe	1	0	1	1	1	1
37.	Bow, long projection	1	1	0	1	0	0
38.	Bow, no projection	0	0	1	0	1	1
39.	Bow, horizontal	1	1	0	1	0	0
40.	Bow, decorated	1	1	0	1	1	0
41.	Bow, upturned knob	0	0	1	0	0	0
42.	Stern, upward curving	1	1	0	1	0	0
43.	Stern, upturned knob	0	0	1	0	0	0
44.	Stern, no projection	0	0	0	0	1	1
45.	Seams covered	1	1	0	0	0	0
46.	Seams decorated	1	1	0	0	0	0
47.	Outside rubbed down	0	0	0	1	1	1
48.	Lashings invisible outside	0	0	0	1	1	1
49.	Lashings visible inside and out	1	1	1	0	0	0
50.	Decoration elaborate	1	1	0	0	0	0
51.	Decoration slight	0	0	0	1	1	0
52.	Canoes painted	0	1	0	0	0	0
53.	Double canoe rare	0	1	0	0	0	0
54.	Double canoe equal size	1	1	1	1	0	0
55.	Double canoe unequal size	0	0	0	0	1	1
56.	Double canoe permanent	0	x	x	0	1	1
57.	Double canoe temporary	1	x	x	1	0	0
58.	Sail, inverted triangle	1	1	1	1	1	0
59.	Sail, lateen	0	0	0	0	1	1
60.	Tanged adz present	1	1	1	1	1	0
61.	Tanged adz common	1	1	1	1	0	0
62.	Tanged adz rare	0	0	0	0	1	0
63.	Triangular cross-sections	1	1	0	1	1	0

		M.	N.Z.	H.	Soc.I.	S.	T.
64.	Rectangular cross-sections	1	1	1	0	0	0
65.	Rough finish	1	1	1	1	1	0
66.	Rough finish rare	0	1	0	1	0	0
67.	Complete grinding	1	1	1	1	0	1
68.	Complete grinding rare	1	0	1	0	0	0
69.	Tangless adz secondary	1	1	0	0	0	0
70.	Tangless adz rare	0	0	1	1	0	0
71.	Tangless adz normal	0	0	0	0	1	1
72.	Axes	0	1	0	0	0	0
73.	Melanesian forms	0	1	0	0	0	1
74.	Pounders	1	1	1	1	0	0
75.	Pounders, flat tops	1	0	1	0	0	0
76.	Pounders, phallic tops	1	0	0	0	0	0
77.	Pounders, round tops	0	1	1	0	0	0
78.	Pounders, cross-grip	0	0	0	1	0	0
79.	Pounders, flaring base	1	0	1	1	0	0
80.	Pounders, carved	1	1	0	0	0	0
81.	Pestles	0	1	1	1	0	0
82.	Sinkers	1	1	0	0	0	0
83.	Small figures present	1	1	1	1	0	0
84.	Small figures fish, common	1	0	0	0	0	0
85.	Small figures fish, rare	0	0	1	1	0	0
86.	Small figures human, common	1	1	0	0	0	0
87.	Small figures, human, rare	0	0	1	1	0	0
88.	Large figures common	1	0	0	0	0	0
89.	Large figures rare	0	1	1	0	0	0
90.	Large figures present	1	1	1	0	0	0
91.	Box oval	1	1	0	x	0	x
92.	Box bird form	1	0	0	x	0	x
93.	Box round	0	0	1	x	1	x
94.	Legged bowls rare	0	0	1	0	0	0
95.	Legged bowls common	0	0	0	1	1	1
96.	Legged bowls present	0	0	1	1	1	1
97.	Paddle club	1	x	0	1	0	0
98.	Uu	1	x	0	0	0	0
99.	Stone club	0	x	1	0	0	0
100.	Sickle club	0	x	0	1	0	0
101.	Throwing club	0	x	1	0	1	1
102.	Bludgeon	0	x	1	1	0	0
103.	Fijian types blubs	0	x	0	0	1	1
104.	Shark tooth knives	1	1	1	0	0	0
105.	Shark tooth weapons	0	0	0	1	0	0
106.	Shark tooth sickle	0	0	0	1	0	0
107.	Bow, toy	1	0	1	1	1	0
108.	Bow, fishing or rat hunting	1	0	1	0	1	0
109.	Bow, weapon, important	0	0	0	0	0	1
110.	Bow, weapon traditional	0	1	0	0	0	0

	M.	N.Z.	H.	Soc.I.	S.	T.
111. Sling important	1	0	1	1	1	0
112. Sling rare	0	1	0	0	0	1
113. Sling as toy	0	1	0	0	0	0
114. Sling-stone, double conical	1	0	1	0	x	x
115. Sling-stone, not shaped	0	1	0	1	x	x
116. Throwing cord	1	1	0	0	0	0
117. Throwing cord with stick	0	1	0	0	0	0
118. Spear with detachable head	1	1	0	0	0	0
119. Chiefs stave	1	1	0	0	0	0
120. Chiefs stave with hair	1	0	0	0	0	0
121. Chiefs stave top carved	0	1	0	0	0	0
122. Armor, mats	0	1	1	0	0	0
123. Armor, wicker helmets	0	0	1	0	0	1
124. Armor, breast plates of fiber	0	0	0	1	0	0
125. Armor, like Gilbert Is.	0	0	0	0	1	0
126. Trumpet, cassis shell	1	0	1	0	0	0
127. Trumpet, Triton shell	1	1	0	1	1	1
128. Trumpet, separate mouthpiece	1	1	0	1	0	0
129. Wooden trumpet	1	1	0	0	0	0
120. Drum, cylindrical	1	0	1	1	0	0
131. Drum, canoe-shaped and gongs	0	1	0	0	0	0
132. Drum, horizontal	0	0	0	0	1	1
133. Flute important	1	1	0	0	0	0
134. Flute rare	0	0	0	0	1	1
135. Flute tunable	1	0	0	0	0	0
136. Presence of mouth flute	1	1	0	0	1	1
137. Nose flute important	1	0	1	1	0	0
138. Nose flute present	1	1	1	1	0	1
139. Musical bow present	1	0	1	x	0	0
140. Musical bow with strings	0	0	1	x	0	0
141. Jew's harp	1	0	1	x	0	0
142. Slotted bamboo	0	0	0	1	x	0
143. Bamboo lengths important	0	0	0	0	1	0
144. Bamboo lengths present	0	0	1	0	1	1
145. Stilts important	1	0	0	0	0	0
146. Stilts present	1	1	1	1	0	0
147. Surf boards present	1	1	1	1	1	0
148. Surf boards important	0	0	1	0	0	0
149. Darts important	1	1	0	0	0	0
150. Bowling	0	0	1	0	0	0
151. Coasting, children	0	1	0	0	0	0
152. Coasting, important	0	0	1	0	0	0
153. Coasting, present	0	1	1	0	0	0
154. Kites, important	0	1	0	0	0	0
155. Kites, present	1	1	1	1	0	0
156. Draft game	0	1	1	0	0	0
157. Men, tattooed, waiste to knee only	0	0	0	0	1	1

	M.	N.Z.	H.	Soc.I.	S.	T.
158. Men, tattooed, general	1	0	1	1	0	0
159. Men, tattooed, face	0	1	0	0	0	0
160. Women, tatooed, mouth	1	1	0	0	0	0
161. Women, tatooed, limbs	1	0	0	1	1	1
162. Women, tattooed, girdle	0	0	0	1	0	0
163. Tapa making stone anvil	1	x	0	0	0	0
164. Tapa making hollow wooden anvil	1	x	1	1	0	0
165. Tapa making solid wooden anvil	1	x	0	0	1	1
166. Tapa making square beater	1	x	1	1	1	1
167. Tapa making round beater	1	x	1	0	0	0
168. Tapa making grooved beater	1	x	1	1	1	1
169. Tapa making beater with water marks	0	x	1	1	0	0
170. Tapa decoration, dyed yellow	1	x	0	0	0	0
171. Tapa decoration, free-hand painting	0	x	0	1	1	1
172. Tapa decoration, block painting	0	x	0	0	1	1
173. Tapa decoration stamped design	0	x	1	1	0	0
174. Feather cloaks	0	1	1	0	0	x
175. Feathers pasted in base	1	0	0	0	0	x
176. Feathers in woven fabric	0	1	0	0	0	x
177. Feathers in netted fabric	0	0	1	1	0	x
178. Feathers woven in edges of fine mats	0	0	0	0	1	x
179. Necklaces of braided hair	1	0	1	0	0	0
180. Turban of braided hair	0	0	0	1	0	0
181. Fans, restricted use	1	x	1	0	0	0
182. Fans decorated and elaborate	1	x	1	1	1	1
183. Fly flap, restricted use	0	0	1	0	1	0
184. Fly flap, present	0	0	1	0	1	1
185. Fly flap, elaborately decorated	0	0	1	1	0	0
186. Carving highly developed	1	1	0	0	0	0
187. Carving poorly developed	0	0	1	0	1	1
188. Carving moderatley developed	0	0	0	1	0	0
189. Carving on utensils	1	1	1	1	0	0
190. Carving on tools	1	1	0	0	0	0
191. Carving on houses	1	1	0	0	0	0
192. Carving on canoes	1	1	0	1	1	0
193. Inlay	0	1	1	1	0	1
194. Designs lime filled	0	0	0	0	1	0
195. Painting of rafters, canoes and images	0	1	0	0	0	0
196. Painting of tapa only	0	0	1	1	1	1
197. Painting present	0	1	1	1	1	1
198. Designs curvilinear	1	1	0	0	0	0
199. Designs spiral	1	1	0	0	1	0
200. Designs conventional	1	1	0	0	0	0
201. Designs human forms	0	0	0	1	1	0
202. Designs animal forms	1	1	0	1	1	0
203. Treatment of design, surface zoned	1	1	0	1	1	1
204. Treatment of design, surface striped	0	0	1	0	0	0

	M.	N.Z.	H.	Soc.I.	S.	T.
205. Treatment of design, surface treated as whole	0	1	1	0	0	0
206. Treatment of design, superposition	1	1	0	0	0	0
207. Human figures conventionalized	1	1	1	1	0	x
208. Human figures naturalistic	0	1	1	0	0	x
209. Human figures present	1	1	1	1	0	1
210. Leg half flexed	1	1	1	1	0	x
211. Arms at sides	1	1	1	1	0	x
212. Hands on abdomen	1	1	0	1	0	x
213. Hands on hips	0	0	1	0	0	x
214. Five fingers equal length	1	0	1	1	1	x
215. Three fingers equal length	0	1	0	0	0	x
216. Outer fingers connected by groove	1	0	0	0	0	x
217. Body formed by series of planes	1	0	1	1	0	x
218. Body formed by rounded contours	0	1	1	1	0	x
219. Exaggerated mouth	1	1	1	1	0	x
220. Oval mouth	1	0	1	1	0	x
221. Naturalistic mouth	0	0	0	1	0	x
222. Beaked mouth	0	1	1	0	0	x
223. Prominent tongue	1	1	1	1	0	x
224. Nostril exaggerated	1	1	1	1	0	x
225. Flat nose	1	0	0	0	0	x
226. Bridge of nose not shown	0	1	1	0	0	x
227. Naturalistic nose	0	0	0	1	0	x
228. Oval eye	1	1	1	1	0	x
229. Eye with upward slant	1	1	1	0	0	x
230. Straight eyes	1	0	1	0	0	x
231. Eye with raised rim	1	0	0	1	0	x
232. Exaggerated brows	1	1	1	1	0	x
233. High brows	1	1	1	1	0	x
234. Arched brows	1	1	1	1	0	x
235. Straight brows	0	0	0	1	0	x
236. Straight brows slightly developed	1	0	1	1	0	0
237. Wall terrace and platform	1	0	1	1	1	1
238. Cut stone present	1	0	1	1	1	1
239. Cut stone highly developed	1	0	0	1	0	1
240. Cut stone rare	0	0	1	0	1	0
241. Rectangular slabs of cut stone	1	0	1	1	0	1
242. Mummification present	1	1	0	1	1	0
243. Mummification normal	1	0	0	1	0	0
244. Mummification rare	0	1	0	0	1	0
245. Evisceration	1	1	0	1	1	0
246. Temporary mummification by salt	0	0	1	0	0	0
247. Mummification in special house	1	1	0	1	1	0
248. Earth burial normal	0	0	0	0	1	1
249. Earth burial rare	1	1	1	1	0	0
250. Buried in flexed position	x	1	1	1	0	0
251. Buried in extended position	0	0	0	0	1	1

	M.	N.Z.	H.	Soc.I.	S.	T.
252. Body kept until disintegration	1	1	1	1	1	0
253. Body kept until disintegration rare	0	0	1	0	1	0
254. Body kept until disintegration normal	1	1	0	1	0	0
255. Bones put in sacred places	1	1	1	1	x	0
256. Skulls preserved	1	1	0	1	1	0
257. Vaults present	1	0	1	0	0	1
258. Cannibalism present	1	1	0	0	1	1
259. Cannibalism highly developed	1	1	0	0	0	0
260. Head-hunting present	1	1	0	1	1	1
261. Skulls decorated	1	0	0	0	0	0
262. Skulls preserved	1	1	0	0	0	0
263. Overlords	0	0	1	1	0	0
264. Loose tribal confederacies	1	1	0	0	0	0
265. Large political units	0	0	1	1	1	1
266. Chiefs of little power	1	0	0	0	0	0
267. Chiefs of little power rare	1	0	0	0	0	0
268. Ancestor worship	1	1	1	1	0	0
269. Worship of great gods	0	1	1	1	0	0
270. Worship of village animal gods	0	0	0	0	1	0
271. Priesthood organized	1	0	1	1	0	0
272. Ceremonial priests	1	0	1	1	0	0
273. Inspirational priests	1	0	0	0	0	1
274. Priest-chiefs	0	1	0	0	1	0
275. Human sacrifice present	1	1	1	1	0	0
276. Human sacrifice highly developed	1	0	1	0	0	0
277. Sacred houses with platforms	1	0	0	1	1	1
278. Sacred houses with enclosures	0	1	1	1	0	0
279. Sacred houses temporary	0	1	0	0	0	0
280. Sacred houses taboo	0	0	1	1	0	0
281. Organized instruction	1	1	0	0	0	0
282. Organized instruction for men and women	1	0	0	0	0	0

This table is compiled from Linton's table *without reference to any other data*—even such as might be gathered from the text of his book—and with minor exceptions (cited below) all of the data contained in his tabulation appear in Table I in the same order and classification. In order to treat the data statistically, we have made a separate item of each single trait, descriptive detail, or special characteristic. By this process of reduction to *simple* units, the ninety-three traits enumerated by Linton were expanded into two hundred eighty-two unit traits. Every island group was then scored for each unit trait in one of three ways, thus: presence of trait (score 1); absence of trait (score 0); no data on trait (score x).

An apparent objection to this process of splitting is that it will result in an unequal weighting of the material since certain of the original traits have not been subdivided, whereas certain other traits have been broken up into numerous separate units. Actually, whatever of weighting there may be is inherent within Linton's table and is not altered by our treatment, each of the thirteen main divisions breaking up, by our method, into roughly three times as many units as he makes of them. To wit:

Houses	10 traits, (Linton)	33 (ours).
Canoes	2 traits, (Linton)	26 (ours).
Stone artifacts	11 traits, (Linton)	31 (ours).
Containers	2 traits, (Linton)	6 (ours).
Weapons	9 traits, (Linton)	29 (ours).
Musical instruments	9 traits, (Linton)	19 (ours).
Toys	7 traits, (Linton)	12 (ours).
Dress and ornament	7 traits, (Linton)	28 (ours).
Art	6 traits, (Linton)	24 (ours).
Human figure	8 traits, (Linton)	26 (ours).
Stone construction	2 traits, (Linton)	6 (ours).
Mortuary practices	5 traits, (Linton)	16 (ours).
Miscellaneous	9 traits, (Linton)	25 (ours).

At this point it may be advisable to point out again that our method is primarily an objective process for showing *special* relationships. No one doubts that the island groups considered here belong to that general type of culture called Polynesian. What our method does is to show the little mountain peaks of agreement and disagreement rising above the level plain of general Polynesian culture; in other words, it shows the special relationships within the area.

This being true, it was, therefore, necessary to *eliminate all common elements*, that is, all traits either present or absent in all six of the island groups were disregarded. Throughout Table I we have made the presence of a trait a first unit; then, whenever the data contained the requisite information, we have made further units on the basis, first, of varying degrees of development, importance, (as given by Linton) and frequency; second, of special characteristics of style, type of construction, etc.

It is apparent that data such as these, the intention of which is descriptive, do not lend themselves to numerical treatment with-

out certain judgments being passed in the course of their reduction to statistically comparable units. In order that the reader may know just what these judgments are, we append below a summary of our interpretations.

Such entries in Linton's table as "not reported," "not found," "found archeologically," were scored as 0 (absent) in Table I.

Under Houses. 1) Platform—Samoa "limited to temples and chief's houses" we interpreted as rare. 2) Houses on posts—Tonga, "occurrence of storehouses on posts uncertain" we scored as x (no data) in Table I.

Under Canoes. 1) Decoration—Society Islands, "small figures and other carving on bow and stern" we interpreted as "slight decoration."

Under Stone Artifacts. 1) Finish—Samoa, "very crude" was interpreted as "rough."

Under Containers. 1) Boxes—Society, "form unknown" was scored an x (no data).

Under Weapons. 1) Clubs—New Zealand, "characteristic local forms" was scored an x since the information is not sufficient for either a positive or a negative comparison. 2) Bow—Society, "used in chief's game" was interpreted as "toy" in Table I.

Under Musical Instruments. 1) Mouth-flute—Tonga, "rare or absent" was scored 1 (present).

Under Dress and Ornament. 1) Fans—Marquesas and Hawaii, "used by chiefs" was interpreted as "restricted use" in Table I. 2) Fly-trap—Hawaii, "part of chief's insignia" and Samoa, "carried by speaker chiefs," were both interpreted as "restricted use."

Under Art. 1) Human Figures—Samoa, "not used (one doubtful example) was scored 0 (absent). Hence, all the items for Samoa under "Conventions of the Human Figure" were scored 0 for absence.

Under Stone Construction. 1) Rough Stone—New Zealand, "little or no construction in recent times" was scored 0 for absence.

The foregoing explanation shows briefly just how Linton's table was transposed into the form of our Table I. It is now necessary to show in considerable detail the various mathematical steps involved in the statistical interpretation of Table I.

In the first place, it is necessary to list all the possible pairs of combinations of the six groups. There are fifteen of these pairs, thus, "Marquesas-New Zealand," "Marquesas-Hawaii," "New Zealand-Hawaii," etc. A square compartment divided into four cells is then drawn for each of the fifteen pairs of island groups. The following example will illustrate this clearly. Let us take for our purpose the first pair of islands, "Marquesas-New Zealand."

		NEW ZEALAND	
		Present	Absent
MARQUESAS	Present	Present in both.	Present in Marquesas; Absent in New Zealand
	Absent	Present in New Zealand; Absent in Marquesas.	Absent in both.

Now, by consulting Table I, we simply count up the number of traits present or absent in the Marquesas and in New Zealand and enter these totals in the appropriate small cells of the large square as indicated above. Upon doing this, we find the following distribution of traits in our square:

		NEW ZEALAND			
		Present		Absent		Sums
MARQUESAS	Present	90 *74*	(A)	55 *71*	(B)	145 (A+B)
	Absent	41 *57*	(C)	70 *54*	(D)	111 (C+D)
	Sums	131 (A+C)		125 (B+D)		256 Total

The arabic figures indicate the actual totals for each cell.
The italic figures are explained in the second paragraph below.

It is now necessary to get the sum of these figures both vertically and horizontally. Thus, the sum of 90 and 41 is 131; of 55 and 70 the sum is 125. Now, adding horizontally, the sum of 90 and 55 is 145; that of 41 and 70 is 111. These sums added together either vertically or horizontally will give the same answer which is the total number of traits involved. Thus, the sum of 145 and 111 is 256 and the sum of 131 and 125 is also 256. There are 256 traits involved, then, in regard to the two groups constituting the Marquesas-New Zealand pair.

The next step is the calculation of the "chance" frequencies which are indicated in italics in the above square. This is done as follows: for convenience the cells are lettered A,B,C,D, and will

be referred to hereafter by these letters. To get the "chance" frequency for cell A the following formula is used:

$$\frac{(A+B)\times(A+C)}{T} = \textit{the theoretical number of traits in cell A if chance were the only factor operative.}$$

T = total number of traits.

Substituting in this formula, we get:

$$\frac{145\times131}{256} = \textit{74, the theoretical number of traits in cell A if chance were the only factor involved.}$$

Similarly, for the other cells the formulae are as follows:

For cell B. $\dfrac{(A+B)\times(C+D)}{T}$ = the chance frequency.

For cell C. $\dfrac{(C+D)\times(A+C)}{T}$ = the chance frequency.

For cell D. $\dfrac{(C+D)\times(B+D)}{T}$ = the chance frequency.

Substituting in the above formulae, we get the number of traits which would occur in the respective cells if pure chance were the only force operating in the distribution of the data. These chance figures are indicated in italics in the large square above: Marquesas-New Zealand.

Suppose, now, that we let *nss* equal the actual frequency of a cell and let *mss* equal the theoretical or chance frequency. Thus, for cell A in the above distribution *nss* will equal 90 and *mss* will equal *74*.

If, now, we let the difference between *nss* and *mss* equal *dss*, we will get the difference between the actual frequency of a cell and its theoretical chance frequency. Thus, in cell A this difference, *dss*, equals the difference between 90 and *74* or +16, i.e., there are 16 more traits in cell A than there would be if chance were the only force operative in the data. Looking at cell B, we see that the actual frequency, *nss*, is 55, while the chance frequency, *mss*, is *71*. The difference, *dss*, in this case is minus 16, i.e., the actual number of traits in cell B is 16 less than it would be if chance were the only thing involved in the distribution. Thus, *dss* will

be either plus or minus, depending on whether the actual frequency is greater or less than the theoretical chance frequency.

The following check is useful at this point as a means of testing the accuracy of the foregoing arithmetical operations. If the positive values for *dss* are added together, their sum should exactly equal the sum of the negative values for *dss*, and the total sum of all four *dss* values for any square will equal zero. If this sum of the positive and negative values is not zero, then a mistake has been made in the previous arithmetical calculations. Any such mistake must be rectified before continuing.

After getting *dss* for each cell, the next step is to calculate the "cell square contingency." This is done by substituting in the following formula:

$$\frac{(\text{dss})^2}{\text{mss}} = \text{the cell square contingency.}$$

In the case of cell A, substituting in the formula we get

$$\frac{(16)^2}{74} = \frac{256}{74} = 3.46, \text{ the contingency square for cell A.}$$

As the *dss* values are all squared in this process, the minus signs drop out and the values for the cell square contingencies are all positive.

The cell square contingencies are calculated in this way for all four cells and then added together. This sum is X^2. In the case used for illustration the sum of the cell square contingencies for all four cells is 16.29. In other words, the X^2 for Marquesas-New Zealand is 16.29

The values for X^2 were calculated in the way which has been described for each of the fifteen pairs of islands. These values for X^2 are given in Table II.

It now becomes necessary to convert the values found for X^2 into terms of probability expressed by P. This is best done by using Table XII in Karl Pearson's *Tables for Statisticians and Biometricians*, Biometric Laboratory, University College, London. Cambridge University Press, 1914.

Here various values for X^2 are given opposite the corresponding value for P. As we have used four cells in each of our fifteen squares, we use the P given in the column "n equal 4" in Pearson's Table

XII. A moment's glance at Pearson's table will make this clear. The corresponding value of P is thus found for each X^2 interpolating in the usual way if the exact value for X^2 is not given in the table.

For example, in the case used for illustration above, we find by consulting Pearson's Table XII and interpolating, that the P for a X^2 of 16.29 equals .001001. This is an expression of the probability of a similar distribution occurring by chance—in other words, there are only 1011 chances in a million, or one chance in one thousand, that the distribution of traits in the Marquesas and New Zealand is due to chance.

The values for P in each of our fifteen cases are given in Table II opposite their respective X^2 values.

Now P is also an indirect expression of correlation, but possesses the disadvantage of not showing whether the correlation is positive or negative. To overcome this difficulty, Dr. Kroeber suggested the following addition to the contingency method.

Referring back to the large square containing the distribution of traits in Marquesas-New Zealand, we see that cell A contains traits present in both islands while cell D contains traits absent in both. The traits in these cells evidently represent agreements between the two islands. On the other hand, cell B contains traits present in the Marquesas but absent in New Zealand, and cell C contains traits present in New Zealand but absent in the Marquesas. These latter two cells obviously represent disagreements between the two islands. Now, if we find the sum of the agreements and the sum of the disagreements, the difference between the two sums will represent the *excess* number of agreements or disagreements as the case may be. Thus, for any case

(1) $(A+D)-(B+C)=$ the excess of agreements over disagreements *where* $A+D$ *is larger than* $B+C$.

(2) $(B+C)-(A+D)=$ the excess of disagreements *where* $B+C$ *is larger than* $A+D$.

Substituting in No. 1 for our example "Marquesas-New Zealand," we get

$(90+70)-(55+41)=64$ excess agreements over disagreements.

Such a large excess of agreements superficially indicates a high degree of special relationship between the two islands. For confirmation of the figure, however, it is very important to consult the P for this pair of islands. Looking at Table II, we see that the P for Marquesas-New Zealand is .001011. In other words, pure chance has had very little to do with the distribution of traits found in these two islands and the degree of special relationship indicated by the high excess figure of 64 is valid.

The excess agreements or disagreements were calculated as explained above for each of the fifteen pairs of islands, and are listed in Table II. Excess agreements are indicated by positive signs while excess disagreements are marked with negative signs.

Explanation of Table II

The first column in the table shows the various values for the cells A,B,C, and D for each of the fifteen cases. These figures are derived from Table I as has been explained above. The second column in Table II contains the values for excess agreements or disagreements. Column three contains the values for X^2 from which the corresponding values for P in the fourth column are derived. The table is arranged to read from the greatest number of excess agreements down to the greatest excess of disagreements.

Concluding the explanation of the method, we may say that the P gives the reliability of the figure expressing the excess of agreements or disagreements. The lower the P, the less potent is the factor of chance and the greater the reliability of the *excess* figure. Just where the line shall be drawn to show this validity is a matter dependent on the set of data being used. For example, if, in a certain set of data, most of the values for P are high, say around .60 or .70, but one P has a value of .30, then this low P is very significant. On the other hand, another set of data may show values for P running around .002 or .06. In this latter case of P of .30 would show a relatively great factor of chance.

For example, in the set of data dealt with here, inspection reveals that a P of about .30 is the point of division. Then, a P below .30 indicates that the excess figure is valid, this validity

TABLE II

Islands	A	B	C	D	Excess agreements or disagreements	X^2	P
Samoa-Tonga	46	32	13	147	+148	75.00	.000000
Hawaii-Society	78	54	48	93	+69	17.04	.000697
Marquesas-New Zealand	90	55	41	70	+64	16.29	.001011
Society-Tonga	32	56	26	108	+58	7.88	.049119
Marquesas-Society	81	73	44	76	+40	7.23	.065944
Society-Samoa	43	81	35	110	+37	3.54	.321339
Marquesas-Hawaii	79	88	55	67	+ 3	0.22	.956276
Hawaii-Tonga	25	86	33	95	+ 1	0.35	.930439
New Zealand-Society	60	73	56	64	− 5	0.04	.992051
New Zealand-Hawaii	59	75	64	60	−20	1.54	.677677
Hawaii-Samoa	32	102	48	94	−24	3.43	.335656
Marquesas-Tonga	25	108	33	73	−43	4.50	.216631
New Zealand-Samoa	24	98	47	75	−46	9.60	.022856
Marquesas-Samoa	35	121	45	80	−51	5.72	.128463
New Zealand-Tonga	14	100	37	68	−55	17.31	.000625

increasing as the P decreases toward zero. Likewise, a P higher than .30 shows that the corresponding excess figure is not so reli-

able, this unreliability increasing as the P increases toward unity. However, we can draw the line at .30 only after inspection of the other values for P. In another set of data, a P of .30 might be relatively low or high, and the line of division would then be drawn elsewhere. We cannot arbitrarily say that all P's below .30 show reliability and all P's above .30 show unreliability. The matter is purely relative, and the selection of any given value of P below which all figures are reliable and above which all figures are untrustworthy depends wholly on the relative standing of the P's to each other in any set of data.

Two examples may clarify the matter. Referring to Table II, we see that Society-Samoa have an excess agreement of 37 traits. In itself, this excess would seem to indicate a considerable degree of special relationship between the two islands. The P for this group is .321339. That is, there are 32 chances out of 100 that this excess figure is due to chance. This means that the odds here are 2 to 1 against chance. Such odds, of course, are considerable; but when we look over the list of all the P's in Table II we see that there are many cases with much greater odds against chance. *Relatively*, then, a P of .32 is pretty close to the border line of validity for this particular set of data. We may conclude, then, that although Society and Samoa have an excess of 37 agreements, this excess is not nearly so reliable as it might be although it is still sufficiently reliable to be quite significant.

Again, we see that New Zealand and Hawaii have an excess of 20 disagreements which would seem to indicate a rather large degree of dissimilarity between the two islands. However, the P for these two groups is .677677, which means that the odds against chance being the sole factor involved are only 2 to 3. In other words, in the set of data dealt with here, a P of .67 indicates a considerable preponderance of chance and shows that the dissimilarity indicated by the 20 disagreements is largely superficial and really due to nothing but chance. On the other hand, Tonga-New Zealand show an excess of 55 disagreements with a P of .00625, which indicates that chance has been practically inoperative here and that the observed degree of dissimilarity is both

high and valid. A few moments' study of Table II will serve to clear up any points remaining obscure.

From an examination of the figures in the preceding tables, various conclusions regarding the relations of the islands within the group to each other may be adduced. It is well to reiterate here, perhaps, that our interest is in the presentation of a method, and the ethnological conclusions which we give must be regarded in the light of a demonstration of the workability of our method. In no case do our conclusions go beyond the tabulated data and their numerical demonstration. It is our belief that our figures will prove highly suggestive to specialists in Polynesian ethnology, both as to the positive tendencies they seem to indicate for further investigation along the lines here started, and as to inadequacies and other weaknesses of the present data.

A study of Table II reveals the outstanding fact that the three highest positive excess figures with very low P's are for three pairs of islands none of which appears more than once. That is to say, the six islands fall into three groups which are primary. These are the three culture areas which are alluded to by Linton—Samoa-Tonga, Hawaii-Society, and Marquesas-New Zealand. A glance at a map of Polynesia will show the striking fact that these affiliations run counter to geography.

Again referring to Table II, we see that the last four groups have the greatest excess of disagreements with low P's which indicate that the excess figures are valid. All four of these are comparisons of the group Samoa-Tonga with Marquesas-New Zealand and exhaust all the possible relations between them. Thus, Samoa-Tonga and Marquesas-New Zealand have markedly greater divergence from each other than either has from the third culture area, Society-Hawaii.

Next to the three primary groups, we see that highest excess agreements (lines 4, 5, and 6 in Table II) all include Society. These figures all have reasonably low values for P which insures their reliability. This means that Society not only belongs to the primary culture area of Society-Hawaii but also has definite secondary affiliations with the two other groups, i.e., with Samoa-Tonga and with Marquesas. This makes Society the most

generally connected of any of the six islands considered. But whether Society was an active source of culture which was carried out into Polynesia or simply acted as a passive focus which received a certain amount of culture from everywhere else, the figures do not show.

The remaining cases (lines 7, 8, 9, 10, and 11 in Table II) have the lowest excess figures with very high values for P. Thus, any apparent agreements or disagreements here are largely due to chance and there is no relationship except a generic Polynesian one. In these cases, there are four comparisons of Hawaii with members of the other areas. As the P's show a high chance factor here we must conclude that Hawaii has no specific relations with any other member of the group except Society with which it forms one of the three primary areas referred to above. Hawaiian culture, then, consists of two things, generic Polynesian elements and elements from Society.

On the other hand, Society has secondary affiliations with every member of the group except New Zealand. Therefore, New Zealand was not reached by specific Society influences while apparently Hawaii was reached *only* by them.

Regarding Samoa-Tonga, the relations of each to Marquesas and New Zealand are about equal both as the excess figures and the reliability of these figures. But in relation to Society and Hawaii, Tonga is much nearer than Samoa. We may then conclude that Tonga probably had somewhat more of a connection with Society, and through this with Hawaii, than did Samoa.

The high degree of special relationship between Samoa and Tonga is due to absences. That is, of the 282 traits considered here, so many were absent in both Samoa and Tonga that the relationship between them is overemphasized by the figures. Their relationship consists in a common *lack* of many traits found in the other groups. However, this does not affect our interpretation of the results because it shows even more clearly than in the other cases that Samoa-Tonga is a separate entity and makes it stand out more definitely than before as a primary area.

Summing up, we may say that the simplest interpretation of all these relationships is that there were two varieties of Polynesian

culture which differed considerably. One of these is represented in Samoa and Tonga while the other is shown by Marquesas, New Zealand, and perhaps elsewhere. This latter type must be old; the Samoa-Tongan culture may be old or new. A third culture form, which is apparently new, overlaid the ancient Marquesan form but failed to reach New Zealand. It flooded Hawaii and either centered or culminated in Society. This culture also had some degree of relationship with the eastern type, primarily through Tonga.

Whether this Society form of culture was carried to Samoa and Tonga, there to be accepted as an overlay on the old native culture, or whether specific Samoa-Tongan elements were accepted in Society is not clearly indicated by our figures. This, however, is due to the fact that the data used were collected primarily from the standpoint of Marquesan culture.

The main outlines of our interpretation are shown graphically in the diagram.

The above results show, we believe, the practicability of our method and also its objectivity. It will be interesting to see just how it works out when applied generally in the field of ethnology.

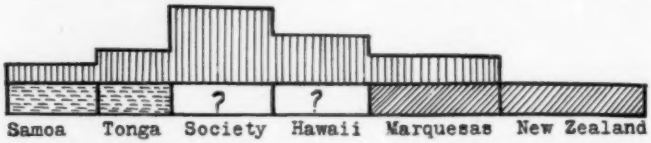

FIG. 1.

KEY TO FIG. 1.

Old New Zealand-Marquesan culture.

Samoan-Tongan culture.

?? Old Society-Hawaii culture?

Overlaid culture, origin uncertain, but most strongly marked in Society.

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AN ANALYSIS OF THE FIRST SALMON CEREMONY[1]

By ERNA GUNTHER

A CEREMONY marking the advent of the first salmon run of the season is general among North Pacific Coast Indians. Many of the ceremonial features are similar throughout the area, yet the question remains in how far these common elements are dependent on the salmon run and how far they represent a diffused ceremonial complex.

The majority of tribes on the coast make salmon one of their principal foods. This is true of tribes as far inland as the Rockies, that is, wherever they live on streams which have connection with the ocean. Several varieties of salmon (*Oncorhynchus*) are abundant from Monterey, California to Bering Sea. When these fish run up the rivers in enormous numbers to spawn, the great fishing season commences for the Indian. In most localities there are no salmon in the streams during some seasons of the year, or if any are to be found the quality is so poor that the Indians do not use them. Hence the coming of the first salmon is a real event, for it means not only a change from the diet of dried meats and fish, but in many instances saves the people from imminent starvation.

I will give a description of four typical first salmon ceremonies and then deal with the following questions: first, is the distribution of this ceremony co-extensive with the use of salmon? Second, what is the relation of this ceremony to the ceremonial complex of the tribe, especially to other first-fruits ceremonies? Finally, what is the attitude toward the salmon as shown by this ceremony and by myths and taboos?

The northernmost people practising the ceremony are the Tsimshian. When the first salmon of the year is caught, four old shamans are called to the fisherman's platform, bringing a new cedar bark mat, bird's down and red ochre. They spread out the mat and a shaman puts on the fisherman's clothing. He holds a rattle in his right hand and an eagle's tail in the left. The shamans

[1] Read before the British Association for the Advancement of Science, Toronto, August, 1924.

put the salmon on the mat and taking it up at the four corners, carry it to the chief's house, the shaman dressed in the fisherman's clothing leading the way and shaking his rattle. All young people who are unclean are ordered to leave. The old people enter the house in front of the procession. After the procession has passed in, all the shamans of the village dressed in ceremonial regalia enter. The salmon is placed on a cedar board and the shamans march around it four times. Then the shaman wearing the fisherman's clothes calls two old shamans to cut the fish. The head is cut off first, then the tail is cut, never broken, with a mussel-shell knife. A stone or metal knife would cause thunderstorm or disaster. While cutting the fish they call it honorary names. They cut along the ventral side and remove the stomach.[2]

The second area is that of the Kwakiutl-speaking peoples. The Kwakiutl are justly famous for their complete ritualization of life. In regard to the salmon ceremony they have lived up to their tradition, for where most tribes have one ritual they have at least three. The first is really an individual ritual. Every wise salmon fisher has prayers which belong to him personally. These prayers are offered when the first catch of salmon is made with the hook. When some are caught, the fisherman goes to the river house and prays to the fish to be good while he is drying them. He prays:

> Swimmer, I thank you because I am still alive at this season when you come back to our good place, for the reason why you come is that we may play together with my fishing tackle, Swimmer. Now, go home and tell your friends that you had good luck on account of your coming here, and that they shall come with their wealth bringer, that I may get some of your wealth, Swimmer; also take away my sickness, friend, supernatural one, Swimmer.[3]

The other ceremonies are the collective rituals used elsewhere. As soon as the first four silver salmon of the run are caught the wife of the fisherman meets him on the beach. She prays to the silver salmon, picks them up and lays them on the beach before their house. She cuts them with a fish knife so that the head and

[2] Franz Boas. Tsimshian Mythology, 31st Report, Bureau of American Ethnology, 1916, p. 450.

[3] Franz Boas. Ethnology of the Kwakiutl, 35th Report, Bureau of American Ethnology, 1921, p. 1318–1319.

tail are left on the backbone. She sets up roasting tongs on the beach and fastens the salmon so that the eyes project on the tongs. Later the tongs are carried into the house and placed by the fire. As soon as the eyes blacken, the fisherman calls together his family group to eat them for if roasted eyes are kept in the house overnight, the silver salmon will disappear from the sea. The guests who are called sit behind the fire. The hostess spreads new food mats and places the tongs with the eyes before the guest.. She gives them water to drink before eating. The guest of the highest rank prays to the food before it is eaten. The fisherman's wife picks up all bones and skin, wraps them in a food mat and throws it in the sea. The guests rub their hands, but do not wash them, and wipe them on shredded cedar bark as they usually would do.

At the ceremony for the first dog salmon the wife of the fisherman again officiates. She prays to the salmon:

> O Supernatural Ones, O Swimmers, I thank you that you are willing to come to us. Don't let your coming be bad, for you come to be food for us. Therefore I beg you to protect me and the one who takes mercy on me, that we may not die without cause, Swimmers.

The woman replies "Yes" to herself. She goes up the bank and there cuts the fish. The intestines of a speared salmon are broken off at the anal fin, while those of a salmon caught on the hook are cut. If these rules are not followed the fisherman's line will break. The entrails are gathered in a basket and poured into the sea at the mouth of a river for it is believed that various kinds of salmon at once come to life when the intestines are put into the water.[4]

Among the Lower Lillooet the ceremony is preceded by watching and praying at the fishing-places, a feature that also occurs in northern California. When the salmon have passed up the river the chief under whose supervision the ceremony is performed sends a boy to pray at each fishing-place for a heavy run. Just before the catch the tops of the weir poles are decorated with owl, hawk, red-wing, flicker or eagle feathers. At fishing places without weirs, poles are decorated with feathers and set up. Then the chief orders a man to go out in a canoe and make the first catch. Before taking

[4] Boas, *Ibid.*, p. 609–611.

the salmon from the water it is rolled up in a mat, for if it saw the ground, no more fish would come. They wait until it is dead on the shore; then rolled it in leaves and branches of a bush with red berries. They carry it to the place where a new kettle stands ready to receive it. New stones for boiling are used and are first dipped into a new basket of water to clean them. The salmon is boiled whole, then lifted out with sticks and laid on a new mat in order to pull off the fins and take out the backbone. It is boiled again until it is reduced to a mush. Then it is divided with a new spoon and put into two new dishes. Now the people are all assembled to eat the fish. Unmarried adult women, menstruating women, orphans, widows or widowers are not allowed to eat the first salmon. All others must eat some of it, the men from one dish, the women from the other.

If the first salmon were cut with a knife, there would be no run. The humpback is regarded as the chief of the salmon and is believed to lead all other salmon away from the sea, so if he is prayed to, the salmon will come quickly. He is frequently treated with as much reverence as the first salmon caught earlier in the season.[5]

Hill-Tout records another Lillooet salmon ceremony, specifically for the sockeye which according to him was regarded as the chief of the salmon. It is conducted in much the same way but adds an elaborate introduction of the salmon to the elders of the village by laying the right fin of the salmon on a series of rods, each named for one of the elders. In this way the salmon is welcomed into the tribe. After a feast of salmon cooked to a mush there is a ceremonial dance. After the feast, the bones are thrown into the water so they can revive.[6]

These ceremonies differ radically from those to the south, for in the Puget Sound region and beyond the ceremonial eating of the salmon is practically the whole ceremony. The Snohomish at the mouth of the Snohomish River on Puget Sound allowed

[5] James Teit. The Lillooet, Memoirs, American Museum of Natural History, vol. IV, part 5, 1906, p. 280–281.

[6] Charles Hill-Tout. Report on the Ethnology of the StlatlumH of British Columbia, Journal, Royal Anthropological Institute, vol. 35, 1905, p. 140.

nobody to step over the first salmon. The man who caught the first fish invited all his friends to a feast at which everyone except the host ate some of the fish.[7] From this point southward the ceremony always centers around the eating of the salmon. The ritual is generally very simple. Sometimes the mode of cutting the fish and the persons who are to partake of it are specified. The southernmost ceremony occurs among the Northern Maidu.[8]

The first question is whether all Pacific Coast people who use salmon, perform this ceremony for the first catch of the year. The northernmost people who have the ceremony are the Tsimshian, whose neighbors the Bella Coola share their type of ritual, whereas the salmon runs as far north as the Yukon where the dog salmon goes up the river in July.[9] There are no accounts of Tlingit or Haida ceremonies although both these people use the fish, hence it may be assumed that they lack the ceremony. The Tahltan have five varieties of salmon which begin running in June but here again no ceremony is noted.[10] Further inland, the Carrier and Chilcotin are quite dependent on salmon for food but no ritual has been described.[11] Among the interior peoples we find the Thompson, Shuswap[12] and Upper Lillooet,[13] who use salmon extensively, have no ceremony. The Shuswap and Thompson say that the salmon is a "hard fish" and does not have to be treated carefully. They claim that it has no real "mystery." The Cowichans of the Delta,[14] the StsÊelis[15] and other tribes along the

[7] Hermann Haeberlin and Erna Gunther. Ethnographische Notizen über die Indianerstämme des Puget-Sundes, Zeitschrift für Ethnologie, 1924, p. 17.

[8] Roland B. Dixon. The Northern Maidu, Bulletin, American Museum of Natural History, vol. 17, 1905, p. 198.

[9] E. W. Nelson. Eskimo about Bering Straits, 18th Report, Bureau of American Ethnology, 1899, p. 183.

[10] George T. Emmons. The Tahltan Indians, University of Pennsylvania Anthropological Publications, vol. IV, part 1, 1911, p. 85.

[11] A. G. Morice. Western Dènès, Proceedings, Canadian Institute, 3rd Series, vol. VII, 1899, p. 128–129.

[12] James Teit. The Shuswap, Memoirs, American Museum of Natural History, vol. IV, part 7, 1909, p. 602.

[13] James Teit. The Lillooet, p. 280.

[14] Franz Boas. Indians of the Lower Fraser River, British Association for the Advancement of Science, Report, 1894, p. 461.

[15] Charles Hill-Tout. Ethnological Report on the StsEelis and Sk'aulits Tribes

Fraser River, share the elaborate first salmon ceremony of the Lower Lillooet. On Vancouver Island the Kwakiutl on the east coast and the Nootka on the west coast have much the same ceremony, but I could find no information concerning the Salish tribes of the island.

About Puget Sound the ceremony seems to be practised generally. For the Klallam I have conflicting data. An informant who was raised in the village where Dungeness, Washington, now stands, gives an account of a ceremony similar to that found elsewhere on the Sound, while another informant whose native village was about ten miles east of Dungeness tells me that salmon ran all year in the Dungeness River so that there was no ceremony to mark its coming in the spring.[16]

It is possible here that one village had the ceremony and the other did not. The Nisqually[17] and Puyallup,[18] who are closely related linguistically and culturally to the Snohomish, have similar simple ceremonies. All the Chinook tribes on the Columbia River from its mouth to the Dalles perform a salmon ceremony very similar to the Snohomish.[19] The Wishram, who live at the Dalles, suspend all fishing after the first spring salmon is caught until after the ceremony has been performed. The fisherman carries the fish to a shaman who cuts the fish lengthwise, taking out the head and backbone in one piece. The fish is baked in a depression in the ground, which is lined with choke-cherry leaves and covered with mats. Everyone is invited and gets some of the fish. They pray at the feast. The bones are not returned to the river.[20]

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of the Halkomelem Division of the Salish of British Columbia, Journal, Royal Anthropological Institute, vol. 34, 1904, p. 330.

[16] Field notes gathered under the auspices of the Department of Anthropology, University of Washington.

[17] George Gibbs. Tribes of Western Washington and Northwestern Oregon, Contributions to North American Ethnology, vol. I, 1877, p. 196.

[18] Arthur C. Ballard. Personal Communication.

[19] James G. Swan. The Northwest Coast, 1857, p. 107–108; George Gibbs, *loc. cit.*, p. 196; Gabriel Franchère, Narrative of a Voyage to the Northwest Coast of America, New York, 1854, pp. 260–261.

[20] Leslie Spier. Wishram Notes, MS.

The Tillamook and Alsea honor the salmon by boiling the first catch with a simple ceremony.[21] The Kalapuya[22] however have no ceremony because the salmon cannot ascend the falls of the Willamette at the northern border of their territory. In northern California, the Tolowa, Karok, and Yurok[23] have a salmon dance which is said to be much like their deer dance. The Hupa[24] and Shasta have a ceremony which recalls that of the Lower Lillooet in that a person is sent out to watch for the first salmon. The Shasta allow this fish to pass, for this one was believed to lead the others upstream.[25] Salmon was used by the Achomawi and Atsugewi in quantity but there is no record of a ceremony.[26] The Northern Maidu of the foothills prohibit salmon fishing until a ceremony has been performed.[27] In his survey of California Kroeber makes the statement that wherever salmon abound in California there is a salmon ceremony.[28] Salmon are found as far south as Salinan territory, but at the southern boundary of this area they occur only in small numbers for there are few rivers to the coast.[29]

The two eastern outposts of the salmon ceremony are the Paviotso of Pyramid Lake who order a dance five days after the

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[21] Franz Boas. Notes on the Tillamook, University of California Publications in American Archaeology and Ethnology, vol. 20, 1923, pp. 9–10.

[22] Handbook of American Indians, Bulletin 30, Bureau of American Ethnology, 1907, p. 645.

[23] Stephen Powers. Indians of California, Contributions to North American Ethnology, vol. III, 1877, pp. 56, 67.

[24] P. E. Goddard. Life and Culture of the Hupa, Univ. Calif. Publ. Amer. Arch. and Eth., vol. I, 1903, pp. 78–79.

[25] Roland B. Dixon. The Shasta, Bulletin, American Museum of Natural History, 1907, pp. 430–431.

[26] *Id.*, Notes on the Achomawi and Atsugewi, American Anthropologist, n.s., vol. 10, 1908, pp. 212–213.

[27] Roland B. Dixon. The Northern Maidu, p. 198.

[28] A. L. Kroeber. Handbook of the Indians of California, p. 467, Bulletin 78, Bureau of American Ethnology, Washington, 1925.

[29] J. Alden Mason. Ethnology of the Salmon Indians, Univ. of Calif. Publ. in Amer. Arch. and Eth., vol. 10, 1912, p. 124. At present the southernmost salmon are in the Carmel River near Monterey. Dean Cobb of the College of Fisheries said that they may have occurred as far south as the Salinan River in aboriginal times, for the distribution of salmon is very variable.

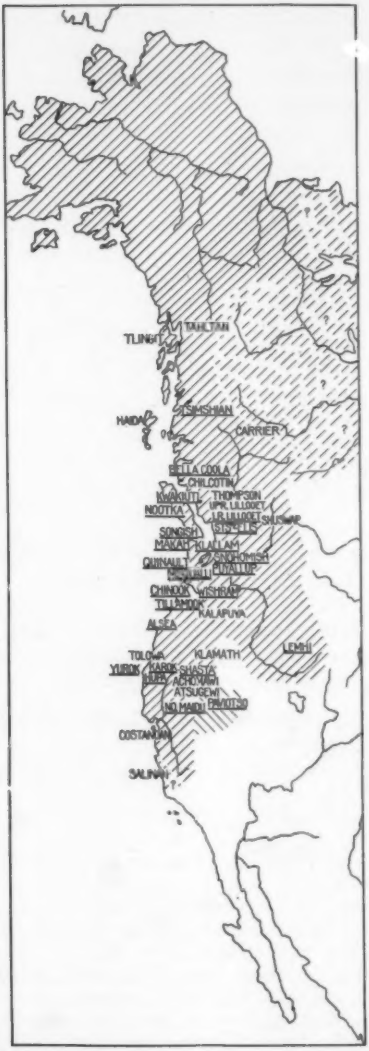

FIG. 1.—Map showing the Distribution of the tribes with the first ceremony (underlined) and the Distribution of the salmon (cross-hatched).

fish come into the lake,[30] and the Lemhi Shoshoni who divide the first catch and feast on it, their faces being painted ceremonially for the occasion.[31] The Kutenai and their neighbors certainly use salmon extensively for food yet they do not express their reverence for it by way of a ceremony.

The area in which salmon is caught extends beyond the area of the ceremony especially to the north and east. The presence of salmon in a particular place is somewhat variable from year to year, for each group of salmon goes back to the place where it was spawned. If a river is avoided one year there may not be any fish in it for several years, depending on the age of maturity of the fish.[32] Even within the salmon area the ceremony is not performed by every tribe that uses the fish. The Klamath Indians, who use salmon sparingly, have no ceremony and none of the taboos that are current elsewhere.[33] The Costanoans who were on the southern margin of the salmon area could catch the fish during the winter months when the water was high.[34] Their culture so far as we know was very simple so that it may be logical not to expect a ceremony among them. The accompanying map gives the general distribution of salmon on the Pacific coast and indicates the distribution of the ceremony.

The procedure of the salmon ceremony has beyond doubt grown out of the regular procedure for handling a salmon catch; the interesting feature is the amount of ceremonial action with which it is garnished and the extent to which this ritual is taken from other ceremonies of the tribe. When the Tsimshian carry the salmon into the chief's house on a mat covered with cedar leaves they are treating the fish as they would treat an honored guest, who is carried to the house on a cedar plank.[35] The Tsim-

[30] Robert H. Lowie. Notes on Shoshonean Ethnography, Anthropological Papers, American Museum of Natural History, vol. XX, p. 306. These people probably have a trout or red fish which is colloquially known as salmon. There is no true salmon in the Great Basin Area.

[31] Robert H. Lowie. The Northern Shoshone, same series, vol. II, 1909, p. 218.

[32] John Cobb. Pacific Salmon Fisheries, Bureau of Fisheries Document, no. 902, 1921.

[33] Leslie Spier. Personal Communication.

[34] Kroeber. Handbook.

[35] Boas. Tsimshian Mythology, p. 438.

shian also greet the first olachen with a ceremony that consists of roasting and eating the first catch.

The Lillooet have a bear ceremony which they share with many tribes to the north and east of them. The attitude toward the bear seems to be very much that which the coast people have toward the salmon. The Lillooet pray to the bear, just as the Kwakiutl pray to the salmon. Here arises the question whether the salmon has been substituted on the coast for the bear which is the object of reverence across northern North America and in many parts of eastern Asia.

Teit records that when the potato was first obtained, it was addressed as "chief" and the Lillooet danced to it four times before it was eaten.[36] When the berry crop is almost ripe the chief addresses the mountain tops and the people pick just enough for a day's supply; to keep them overnight would be unlucky. A similar taboo is found among many coast tribes with regard to the first salmon. The StsÈelis on the Fraser River observe a similar ceremony for the first berries as they do for the first salmon. In northern California the salmon ceremony belongs to a whole group of dances which are given to produce more bountiful wild crops, abundance of salmon, prevention of flood, famine and earthquake.[37] The definitely local characteristic here is the recitation of esoteric formulas.

The pattern for the salmon ceremony seems to be based on a reverential attitude toward the fish and a desire to treat it in such a manner that it will come in great numbers. The actual procedure is taken from the normal handling of the catch with such additional ceremonial features as have been pointed out above. The other first-fruits ceremonies in this area share with the salmon ritual a ceremonial eating of the product in many cases followed by a dance. The possibilities for developing something strikingly different are after all limited. It is clear, however, in spite of the meager information available, that some features of the general ceremonial life in each tribe have been infused in the procedure. Californian

[36] Teit. The Lillooet, p. 279.
[37] Kroeber. Handbook, p. 53.

tribes have a social dance where the Kwakiutl have a speech and a feast with guests sitting according to rank.

Finally, the attitude toward the salmon as expressed in mythology and taboo is the same feeling that underlies the ceremonial. The salmon myth on the Pacific coast has a much wider distribution than the ceremony, or rather it occurs among tribes for whom no data concerning a ceremony is available. The typical incidents of the salmon myth are: a boy comes to the salmon country and is told to kill some of the children for food. He is cautioned to save all the bones and throw them into the water so that the children may revive. Very frequently the boy returns home and brings plenty of fish to his village.

The Haida and Tlingit have such a myth but there is no record of a ceremony. Among the Haida is the belief that if a girl sees a salmon jumping in the creek, within a year of her puberty rites, all salmon would leave the creek. For five years after her puberty rites she is not allowed to eat salmon.[37a] The Chilcotin have the myth. The Quinault, who also tell such a story, express their attitude toward the salmon by the taboo that the first catch is never sold for fear that the hearts may be destroyed or fed to the dogs.[38]

Very frequently myths dictate ceremonial behavior. In this instance the feeling expressed in the myth and the ceremony may be regarded as alike, but the only concrete feature carried from the story to the ritual is the instruction that the salmon bones be thrown back in the water, this being based on the theory that salmon revive when their bones are returned to the river. This belief is not limited to salmon. The Shuswap who have no such regard for the salmon throw beaver bones back into the streams that they may come to life again.[39]

Special relations to food animals are universal and the salmon comes in for a liberal share. Throughout the salmon area there is

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[37a] John Swanton. Contribution to the Ethnology of the Haida, Memoirs, American Museum of Natural History, vol. VIII, pp. 48–49.

[38] Cobb. Pacific Salmon Fisheries, p. 23.

[39] British Association for the Advancement of Science, Sixth Report on the tribes of Northwestern Canada, 1890, p. 644

some association between salmon and twins. The Tsimshian believe that twins have the power to call olachen and salmon.[40] The Kwakiutl believe that twins of the same sex were salmon before birth.[41] The Nootka believe the father of twins to be an instrument of the salmon world and during the fishing season he devotes his entire time to singing and performing secret rituals to propitiate the salmon so that there may be a maximum catch. The appearance of twins forecasts an unusually large run. A twin child will burst into tears if a salmon is mistreated.[42]

When Makah twins are born during the fishing season at Tatoosh Island the parents are sent back to Neah Bay and prohibited from eating any kind of fish.[43] Similarly, the Klallam do not allow the parents of twins to come near salt or fresh water for one year after the birth of the children. The Klallam from all the villages along the Straits of Juan de Fuca used to go to Hood Canal in the fall of the year to catch and dry salmon. On one occasion a woman from Clallam Bay gave birth to twins there. She and her husband had to carry the children overland instead of returning home by canoe on account of this taboo. The Klallam of Dungeness relate that one of the early white families on the river had twins and they besought the father of the children not to fish because he would spoil the run of humpbacks which was then in the Dungeness River. He disregarded their petition and as a consequence there were no humpbacks in the river for twenty years.[44]

Here again the pattern is a relation between twins and salmon, but the relation differs from tribe to tribe.

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[40] Boas. First General Report on the Tribes of Northwestern Canada, Brit. Assoc. Adv. Science, 1889, p. 847.

[41] Brit. Assoc. Adv. Science, Sixth Report, p. 614.

[42] Edward Sapir. "Nootka" in Hasting's Encyclopedia of Religion and Ethics.

[43] James G. Swan. The Indians of Cape Flattery, Smithsonian Contributions to Knowledge, vol. 16, 1870, p. 82.

[44] These two incidents are taken from my recent field notes. In discussing the second incident with Dean Cobb of the College of Fisheries, University of Washington, I learned that it may be true that for many years there was no humpback run in the Dungeness River because through some accident they may not have been able to spawn there one season. After such an occurrence the fish may avoid the stream for a long time.

There is on the North Pacific coast a reverent regard for salmon which is one of the principal food animals. This regard shows itself in the rituals which are performed for the salmon, the taboos surrounding it, and in its place in mythology. The first salmon ceremony follows a pattern used in other first fruits ceremonies of the area, and draws on other ceremonial complexes of the tribe. The particular relation to the salmon is further akin to the attitude toward the bear in adjacent areas of North America and Asia. Within our area the fundamental and widespread feature of the first salmon ceremony is in the attitude toward the salmon, although its expression varies somewhat from tribe to tribe. This is of such a character as to suggest the diffusion of at least this basic idea. The diffusion of minor details among neighboring groups suggests possible historic connection in the borrowing of these ceremonial features.

SEATTLE, WASHINGTON.

A SANDAL FROM NORTHEASTERN ARIZONA

BY A. V. KIDDER

THE sandals so commonly found in the caves and cliff dwellings of the San Juan drainage are roughly divisible into two classes: (1) those made of yucca leaves, cedar bark and other coarse materials; (2) those woven from finely twisted cords. The latter class is subdivisible into three main types: (a) the square-toed; (b) the scallop-toed; (c) the sharp-toed. The square-toed type is characteristic of the Basket Maker culture; the sharp-toed type of the pueblos and cliff dwellings.[1] The scallop-toed sandal has recently been determined by E. H. Morris and S. J. Guernsey to belong to the so-called post Basket Maker culture, a phase succeeding the true Basket Maker and preceding the pre-Pueblo. The pre-Pueblo sandal-type is not yet certainly distinguishable, but it seems to be rather closely analogous to that of the Pueblo period.

The above indicates the classificational value of sandals; it may not be amiss, therefore, to describe an example of the scallop-toed variety which has recently come into the writer's possession. The specimen (Pl. I, a, b) was found a number of years ago in a cave of the Chinlee system, presumably in Cañon de Chelly. As the photographs show, it is in fairly good preservation, is not rotted at all, but is chafed through in two places, and was evidently discarded by its owner as worn out. Its dimensions are: length, nine and three-fourths inches; greatest width, four and one-half inches; thickness of heel portion, three thirty-seconds of an inch. It had originally a square heel, probably drawn up by the heel-loop or the tie strings into a pucker; the heel, however, now lies flat and is rounded at the corners by wear. From the heel to within three inches of the toe the sides are straight, but diverge slightly from each other; the forward part is double thickness,

[1] In Bull. 65, Bureau of American Ethnology, pl. 68, and Fig. 38, will be found illustrations of these two types. For a photograph of several scallop-toed sandals see Cummings, *Ancient Inhabitants of the San Juan Valley*, p. 10.

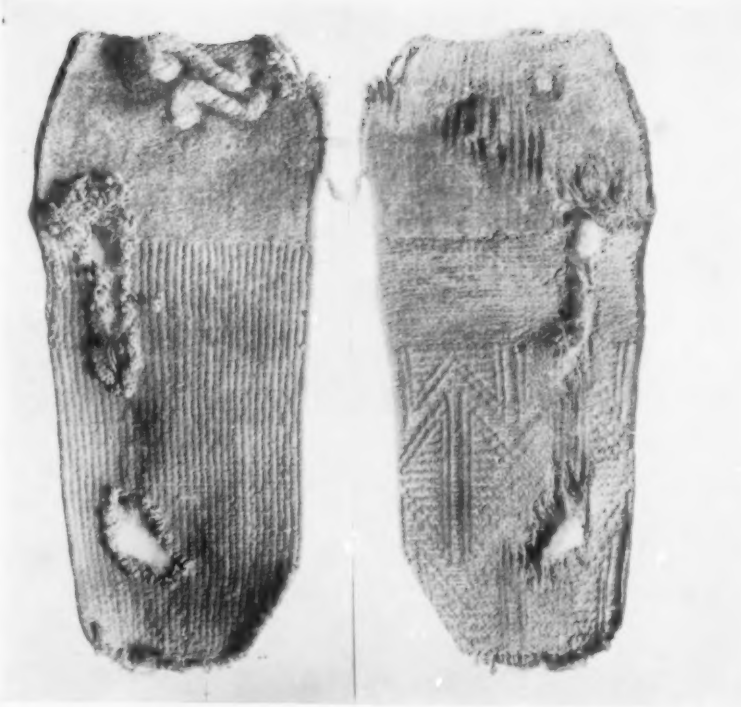

PLATE I

PLATE I, a—Upper surface of post-Basket Maker sandal.
b—Sole of post-Basket Maker sandal.

swells somewhat, narrows again, and ends in a broad shallow scallop across the toe. The slight asymmetry of the broad forward part is not a common feature of this type of sandal, most examples not being shaped for right or left foot. Whether this particular

FIG. 1a FIG. 1b

FIG. 1, a—Colored designs of forward and middle zones—upper surface of sandal. The dissection shown in Fig. 7 is indicated by a small arrow.

FIG. 1, b—Colored design of forward zone, and outline of raised design of rear zone—sole of sandal.

specimen was so shaped or whether its asymmetry is due to faulty weaving cannot be told; the nature of the wear and the imprint of the toes under the toe-loop show, however, that it was used on

the left foot. The toe-loop, a doubled, three-strand yucca string, is fastened securely into the fabric; it enclosed the second and third toes. The heel-loop has disappeared, though one of its attachments may still be made out (Pl. I, a, left-hand corner of heel).

The sandal is elaborately decorated. Colored designs occupy the forward half from one-half inch from the toe to four and three-fourths inches from the heel. They consist of two bands (see Fig. 1, a); the forward one covers that part of the sandal which is of double thickness (see Pl. I, a; the decoration cannot be made out in the photograph, but its position is indicated by the area of smooth-woven surface); the second band lies just behind the forward one (see Pl. I, b and Fig. 1, a). These colored designs, whose nature will be described below, appear on both surfaces. A raised pattern, occupying the remainder of the sandal to the heel, is only visible on the sole (Pl. I, b; Fig. 1, b).

To study the weaving that went into these elaborate designs it was necessary completely to dissect the specimen; it was carefully picked apart, beginning at the heel (thus reversing the process of construction); the wefts were counted and the nature of the different knots and ties recorded by drawings and by reproducing them on a weaving frame.

To make clear the weave it is necessary to start, as of course did the weaver, with the warps. These are thirty-three extremely stiff, three-ply yucca cords about one sixteenth of an inch in diameter. They run the entire length of the specimen, are doubled at the toe and turned back underneath, each one paralleling itself on the underside throughout the forward decorative zone (Fig. 2). At the rear termination of this zone they are cut off evenly (the transverse line of the clipped ends may be made out between the forward and middle zones on the under side of the sandal, see Pl. I, b).

Toe.—The doubling of the warps was not done until the first few insertions of the weft had been woven in. The warps were first laid out side by side, or more probably were suspended in such a way that they hung parallel to each other, with the proper intervals between them. Then, at the place where the toe of the

finished sandal was to be, there were run in ten rows of twilled over-two-under-two twined weaving (Fig. 4, a), the wefts being (as throughout the entire specimen) of soft two-ply *apocynum*(?)

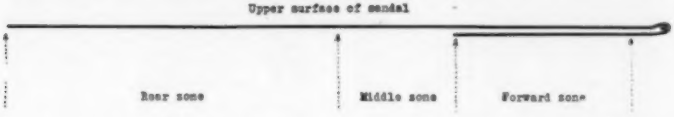

FIG. 2—Diagrammatic side view from the right of a single warp to show doubling at the toe.

string slightly less than one thirty-second of an inch in diameter Thus was produced a strip of web not quite one half inch wide running across the warps near their upper ends, and holding them firmly together at the correct distance apart (Fig. 3). The doubling

FIG. 3—Diagram of warps with the initial strip of web woven in. The doubling to produce the toe of the sandal will take place horizontally across the middle of this strip.

now took place. A two-ply yucca cord of about the same weight and stiffness as the warp-strings was laid across the middle of the strip of web on what was to be the under side of the sandal and the strip was closely creased over it, thus bringing the shorter end of each warp into parallel juxtaposition with its longer end. As the

fabric of the narrow strip of web was tightly woven, and as the warps were very stiff, the tight creasing could hardly have been done with the fingers alone, but was presumably finished by

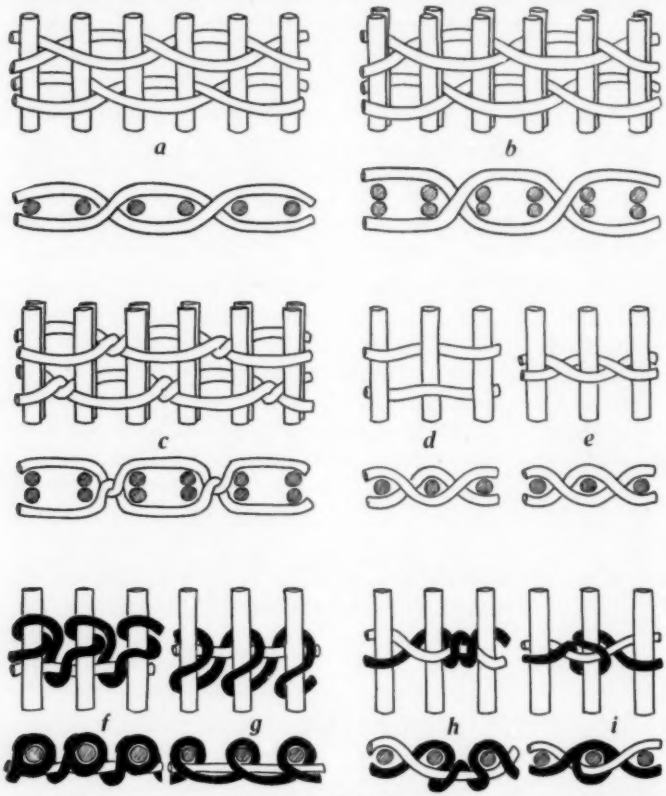

FIG. 4—The nine weaves used in the sandal (in the sectional views the sole is always below). a—Twilled twined weave over pairs of single warps. b—Twilled twined weave over pairs of doubled warps. c—Twilled lock-weave over pairs of doubled warps. d—Plain weave. e—Plain twined weave. f—"a" weaving. g—"b" weaving. h—Double-wrap knot. i—Single-wrap knot.

pounding with a smooth, heavy stone. The twilled over-two-under-two twined weaving was now continued, but instead of

being over pairs of single warps, it took in the doubled warps (Fig. 4, b) and so bound the turned-down shorter ends firmly to the longer ones. Where the doubling took place there was left running across the toe of the sandal, a narrow tunnel or tube in the fabric. In the tube there remained the yucca cord over which the crease was made. In the dissection of the sandal this cord was

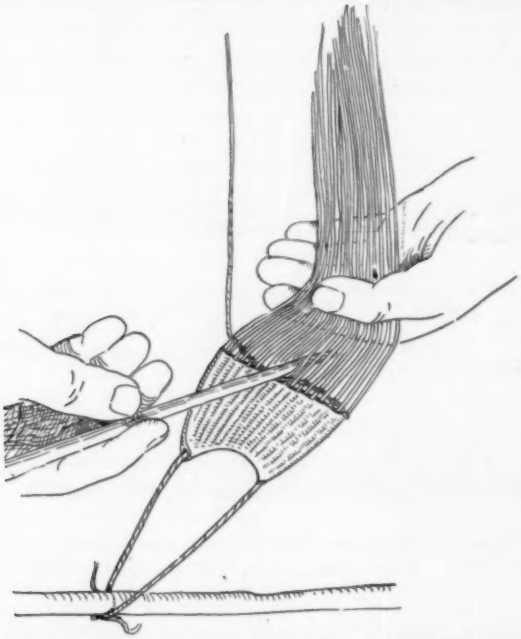

FIG. 5—Probable method of suspending sandal by toe-string during weaving.

found still in place, closely clipped off at either end of the tube. I think there is little doubt that the cord was originally a long one whose free ends served to attach the growing sandal to a rigid support in order that there might be something to pull against while the weaving progressed (Fig. 5). I also think it possible that the curving or scalloped form of the toe is due to the pull of this string during the first stages of the weaving (Fig. 5).

The next twelve rows of the fabric were twilled over-two-under-two twining both wefts being natural color *apocynum*. At the end of the twelve rows, or at about five-sixteenths of an inch from the toe of the sandal, was begun the insertion of the forward decorated zone.

Forward Zone (colored design).—This zone was made in twilled over-two-under-two lock-weave, the weft-pair consisting of one natural color string and one dyed string. The pattern occupies the broad or swelled part of the sandal and is shown on Figures 1, a and 1, b. The front half is in black and natural color, the rear half in some dye (red, brown, or perhaps yellow) which has faded

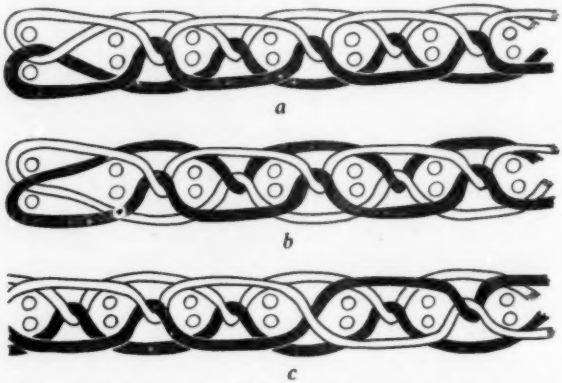

FIG. 6—Diagrams of lock weave. Each diagram is an end view of two rows. a—Selvage at a part of the sandal where the surface is in natural shade, the sole in color. b—Selvage where there is a shift at the edge from natural (front row) to color (rear row). c—Body of the weave with change in front row from natural to color.

badly (shown by shading in the drawings, Figs. 1, a; 1, b) and natural color. The lock-weave (Fig. 4, c) allowed the colored weft to be kept on the upper side or on the sole as desired; but the colored weft was always visible on one surface or the other; hence, the pattern on the sole is the exact reverse of that on the upper side (Figs. 1, a; 1, b). The weave, as was said above, was twilled; . e., the wefts pass over more than a single warp. In this case the order was over-two-under-two, and each successive pick of weft was offset one warp (see Fig. 6), thus producing a flat surface

rather than a ribbed (or rep) one (compare forward and rear parts of the upper surface of the sandal, Pl. I, a). The two-string warps were treated as single cords (see Figs. 4, c; 6) except at the two edges of the sandal. At the edges the two strings of the exterior warp were separated and each element of the weft-pair encloses a single one of them (see Fig. 6, a, b). This resulted in a slight thickening at the edge and produced a strong, neat selvage. When in weaving the pattern, it was desired to shift the color from dyed to natural, or vice versa, it was done as shown in Fig. 6, b, c, the former illustrating a shift at the selvage, the latter a shift in the body of the weave.

The front half of the design consisted of forty rows; then came a series of six rows in which both wefts were of natural color (the plain transverse band between the two parts of the pattern—Figs. 1, a; 1, b); and the rear half was made up of forty rows.[2] At the rear end of the design there was one row of over-two-under-two twined weaving in natural color; this was the last row over the two-strand warps, for at this place the lower series of warp-strings was clipped off, and in the rest of the sandal the warps were single (see Fig. 2). At this point, also, there was laid in one new warp (the fifteenth counting from the right side and looking from above) making thirty-four warps in the rear part of the specimen. Two rows of plain twined weaving in natural color were now introduced (the plain narrow transverse band between the forward and middle zones—see Fig. 1, a).

Middle decorated zone (colored design).—This zone, like the forward one, was in two parts, a front and a rear, and again the pattern was duplicate, the front half in black and natural, the rear half in the same badly faded brownish dye (shaded in the drawing, Fig. 1, a) and natural. This zone cannot be made out in the photograph of the upper side of the sandal (Pl. I, a) because the weave of the upper surface, though slightly different in detail, is so like that of the upper side of the rear zone that the line of demarcation between the two cannot be seen. On the under side

[2] During the dissection of the sandal no knots were found. When a new piece of weft material was to be added, it was apparently merely twisted to the end of the old string and woven with it for two or three insertions.

(Pl. I, b), however, the middle zone, lying between the raised pattern of the rear zone and the smooth surface of the forward zone, may be clearly observed. The design was produced by using, as before, a two-string weft, one strand dyed, one in natural color. There were forty-four crossings of the weft pair, twenty-two in the front half, twenty-two in the rear half. Each left-to-right crossing (counting from the toe and looking from above) was in what we may call "a" weaving each right-to-left (or every other) crossing in "b" weaving. One "a" and one "b" crossing taken together made up one horizontal line in the pattern, which had, accordingly twenty-two lines, eleven black, eleven brownish (see Fig. 1, a).

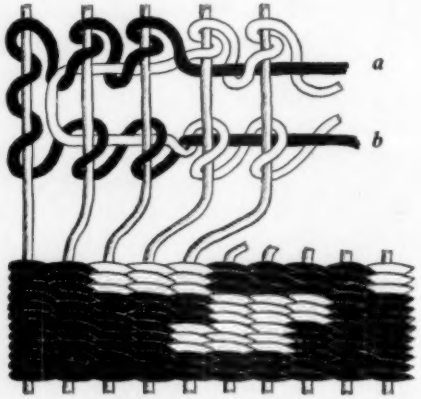

FIG. 7—Magnified drawing of weave of middle decorated zone. The diagram shows parts of four lines of the pattern in the web, and one line, i.e., two crossings of the paired weft, dissected out (this line is indicated by a small arrow in Fig. 1, a).

Both "a" and "b" weaving are alike in having at all times one active (and visible) element and one passive (and hidden) element. In "a" weaving the active element is wrapped about each successive warp in such a way that it crosses it twice on the upper side and once on the lower (Figs. 4, f; 7, a); between the warps it encircles the passive element, which runs straight across on the under side of the warps and is entirely hidden from above when the weave is pulled tight.

In "b" weaving the active element is wrapped about each successive warp in such a way that it crosses it once on the upper side and twice on the lower (Fig. 4, g; Fig. 7, b); in wrapping the warp it also encloses the passive element, instead of taking it in between the warps as was done in "a" weaving. The passive element runs straight across on the under side of the warps and is entirely hidden from above.

As the web of this zone is made up of a double weft, one strand colored, the other light, it will be seen that when the colored strand is active the surface of the sandal at that place will be colored (the passive element being always hidden, see Fig. 7). The reverse, of course, occurs when the light (or natural colored) strand becomes active. The pattern produced is always sharp and clear on the upper surface because only the active element is there visible, but on the sole it is much blurred by the appearances of the passive element which is not entirely hidden on that surface. (For this reason the design is not reproduced in the drawing of the sole—Fig. 1, b).

It was said above that "a" crossings alternated with "b" crossings and that a pair ("a" and "b") made up one line of the design. Each line has three upper side emergences of the active element (two in its "a" row, one in its "b" row—see the dissected-out single line of two rows in Fig. 7). The pattern was produced by alternating colored weft with natural shade weft along the lines, the change always taking place at the same warp in each paired "a" and "b" row; this may be seen in Figure 7 where a change in color is shown dissected out. The same figure illustrates the method of making the selvage by a triple twist of the active element about the exterior warp, the passive element turning back at the second warp.

Rear zone (raised pattern).—The web of the rear zone was produced by using only natural color wefts, so manipulated as to produce on the sole a raised pattern (see Pl. I, b). This area was separated from the middle zone by three rows of plain twined weaving.

The weave of the rear zone is as follows: first (counting from the toe end of the design) comes a row of twined-work complicated

by loopings of the wefts (see Fig. 8, a); this is called a "knot bearer" crossing; the knots and the part they play in producing the raised pattern will be described below. When this row of weaving reaches the left hand edge, one of its elements makes a double turn about the exterior warp, the other a single turn about the warp next within; the two elements then recross the sandal in plain twined weaving (Fig. 8, b; Fig. 4, e); on reaching the right edge the element that made the single turn at the left side makes a double turn about the right exterior warp, recrosses the sandal in plain over-and-under weaving (Fig. 8, c; Fig. 4, d), turns once about the left exterior warp, returns in the same plain over-and-under weave (Fig. 8, d), turns once about the right exterior warp, and there joins with the other weft element (which makes a single turn about the warp next to the exterior one) to form another

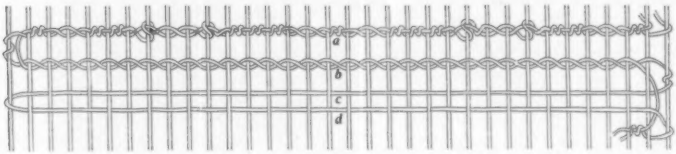

FIG. 8—Diagram of the weft crossings that go to make up each one of the sixty-eight or seventy rows in the rear zone. The knot bearer here shown is indicated in Fig. 9 at a-a.

"knot bearer," the beginning of a new series. There were in the raised decorated part of the sandal about seventy series like the one just described: i.e., one "knot bearer" row; one plain twined row; one double crossing (over and back) in plain over-and-under weaving of one of the weft elements by itself. The first sixty-five "knot-bearers" are reproduced in Fig. 9; the last five or six at the heel were too badly worn to be dissected out with certainty; hence their omission in Fig. 9 and the interrogation points in Fig. 1, b.

While all of the series are the same in sequence of rows, the knots in the "knot bearer" rows are so varied as to their number and their position in the rows as to produce the pattern shown in Pl. I, b; Figs. 1, b, and 9. The knots are of two varieties:

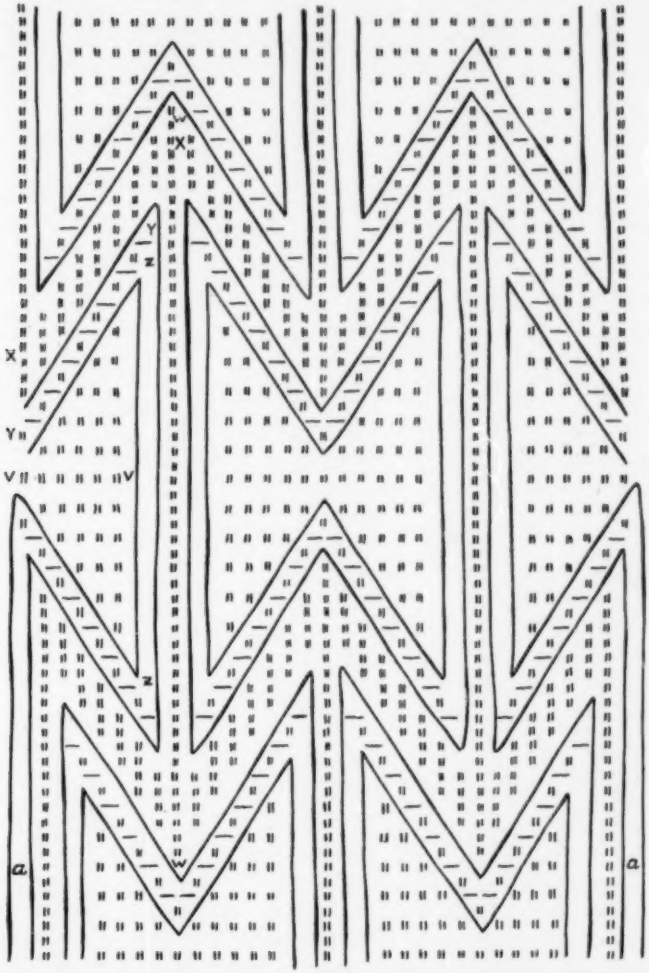

FIG. 9—Diagram showing arrangement of knots in the first sixty-five of the sixty-eight or seventy knot-bearer weft crossings in the rear zone of the sandal (compare Pl. 1, b and Fig. 1, b). The knot bearer reproduced in Fig. 8, a, is here shown at a-a.

(1) The double wrap of one weft about the other (Fig. 4, h, represented by pairs of vertical marks in the diagram, Fig. 9); this results in a little round protuberance on the under side lying between two warps; the work is pulled so tight that the knot only shows on the under side. (2) The single wrap of one weft about a warp (Fig. 4, i, represented by horizontal marks in the diagram, Fig. 9); this results in a short transverse bar over the enclosed warp, also visible only on the under side. These two kinds of knots, variously disposed in the "knot bearer" rows, are the units of the pattern. The rows of plain twined and plain over-and-under weaving that come between the "knot bearer" rows serve to keep the latter apart and thus throw the design into high relief. The pattern as a whole has five sorts of elements: (1) transverse rows of double wrap knots; these rows form the fillings of the enclosed triangular fields (Fig. 9, v-v); (2) longitudinal rows of double wrap knots, i.e., the broad longitudinal bands of the pattern (Fig. 9, w-w); (3) oblique rows of double wrap knots, i.e., the broad oblique bands of the pattern (Fig. 9, x-x); (4) oblique rows of double wrap knots alternating with single-wrap knots: i.e., the narrow oblique bands (Fig. 9, y-y); (5) single warps which have no knots on either side of them: i.e., the narrow longitudinal bands which connect with the narrow oblique ones (Fig. 9, z-z).

Terminal tie.—With the insertion of the last row of twined-work in the rear zone the weaving of the sandal proper was completed. It was now necessary to finish off the work with some sort of tie to hold the warp-ends firmly in place, and prevent the raveling out of the fabric. This was done in the following manner: A stout yucca cord, three-sixteenths of an inch in diameter, was placed across the warps at the place where the square heel was to be; each warp was then made to take a double turn about it from below and was finally brought back around it in the upper surface. The end of each warp was held in place and locked down by the first turn of the warp next in order (see Fig. 10). Lastly, the ends were trimmed off close. How the outside warps were held, and how the two ends of the transverse cord were fastened could not be made out, because the corners of the heel were worn away. It also was not possible to determine whether or not the heel had

originally been puckered up at the corners, as was often done with this sort of sandal.

The sandal that has just been described is an average specimen of its type. There are in museums many examples of finer workmanship. Yet, into this apparently every-day piece of footgear there went about thirty-five feet of three-strand yucca warp, and (at a very conservative estimate based on measurements of dissected-out lengths of weft at various parts of the fabric) 424 feet of weft; and the latter is two-ply, so that there was used a total of 848 feet of fine *apocynum* string. When it is considered that the necessary raw material had to be gathered, the fiber extracted from its parent leaves or stalks, sorted, cleaned, combed, and spun by hand, it can be realized what a tremendous amount of merely preliminary work had to be done. Then, a large part of

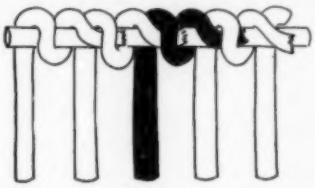

FIG. 10—View from above, showing method of attachment of warps at the heel.

the weft-material was dyed, and finally the complicated fabric was woven. Nine sorts of weaves were employed; the paired weft was run across the warps 437 times, and in the raised pattern on the rear end of the sole there were made more than 1,000 knot-like loopings. During the dissection of the specimen not a single error of any kind came to light.

As to how the sandals of this type were made we have no exact knowledge, for no unfinished example has so far been described. It is obvious that the weaving began at the toe, and there is a strong presumption that the work hung free, because the fabric is almost entirely twined; and twining, which involves the constant crossing of the wefts over each other, would hardly have been practicable if the lower ends of the warps had been held fast in any form of frame or loom. The weave is so tight and stiff that it

must have been beaten home after the introduction of every pick of weft, probably with a slim wooden or bone tool (see Fig. 5).

One is at a loss to account for the making of such beautiful sandals for such humble service. There is little or no reason for supposing that these sandals were ceremonial, for they are found abundantly in the rubbish of all post-Basket Maker caves; coarse sandals, indeed, seem not to have been commonly worn until a much later period. It is a mystery why colored designs so handsome should painstakingly have been woven where they were entirely invisible when the sandals were in use, and where they would quickly have been obscured by sweat and dirt. The raised patterns of the soles were doubtless serviceable in giving extra wear, and in providing a firm grip on smooth rocks, but the extraordinary richness and variety of these, and of the colored decorations as well, can only have been due to pride of craftsmanship, or to magical beliefs.[3]

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[3] The two sandals of a pair were apparently always alike; duplicates not in a pair, however, have yet to be found.

THE CATTLE COMPLEX IN EAST AFRICA

By MELVILLE J. HERSKOVITS

(Concluded)

III

IN THE preceding chapter, it has been attempted to demonstrate that the culture of the peoples of East Africa may be grouped together, the most outstanding trait in all their cultures and that most decisive for such classification being the cattle complex. However, the area is surrounded by other regions, some of which have cattle, some of which lack them. It will be well, therefore, to differentiate the culture of the area considered from that of neighboring regions, for otherwise the limits of the East African area cannot be defined.

1.

In the extreme south of the continent, west of the Kaffirs, the Zulu and the Basuto, we find the Kalahari and Karoo deserts. In these dreary stretches, where it is most difficult to obtain a living, exist the Bushmen, or, as they were originally called, the Bosjesmans.[394] They extend, or extended, from Lake Ngami on the north as far south as the Karoo desert, and to the west as far as Namaqualand.[395] Pressed into their inhospitable country by their neighbors, they are distinguished for their independence, their fierceness, and their unwillingness to compromise or forfeit their freedom in any way to their more powerful neighbors, black or white.[396] It is not difficult to distinguish the culture of the Bushmen from that of the East African cattle-keepers, and only enough will be mentioned of their civilization to so distinguish them. Ratzel observes:

> The idea of a hunting race covers the whole contents of the Bushmans' life at all ages and in all positions.[397]

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[394] Fritsch, Die Eingeborenen Südafrika's, vol. I. pp. 387–388,

[395] Fritsch, op. cit., vol. I, pp. 386–396, discusses their earlier range.

[396] Ratzel, History of Mankind, vol. II, p. 268; Barrow's "Account" of his travels is full of harrowing tales of the fierceness of these people.

[397] *Ibid.*, vol. II, p. 267.

while Schultze agrees with him:

> Die Hauptnahrung liefert dem Buschmann der Sud-Kalahari auch heute die Jagd: . . . .[398]

Barrow, visiting the Bushmen in 1797, also remarked that the individual

> neither cultivates the ground nor breeds cattle; . . . . though marks of their industry appeared in every part of the country, in their different plans of taking game.[399]

Perhaps the most illuminating sketch of Bushmen life is that given to Bishop Callaway by a Kafir:

> The Abatoa are much smaller than the other children of men; they hide in grass and sleep in ant-hills; they go into the mists; they live in high rocks; they have no settled place of abode; their home is wherever they kill game; they eat it all up and go on. . . . .[400]

This is the life of the Bushman in miniature. He has no settled habitation, but lives where the game go, or in chance caves which give him shelter.[401] His only use of cattle is to eat them, and Barrow relates one instance after another in which the herds of the Dutch settlers were raided by these intrepid desert-dwellers. Marriage is not a matter of dowry, but of a mere present to the parents of the girl:

> Dem Buschmann ist das Herz nicht so voll von seinen Ochsen wie bei den gepriesenen Kaffern und somit ist noch Platz darin für Frau und Kind; die Frau rangirt nicht gleich so und so viel Stück Vieh und ist daher bei diesem verachteten Stamm relativ viel angesehener, als bei ihren Verächtern.[402]

Polygamy is difficult, because of their mode of life, and the general poverty. Material possessions are few, and the bow and arrow are perhaps prized above everything else. It would be difficult to

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[398] Schultze, Aus Namaland und Kalahari, p. 659. Passarge, Die Buschmänner der Kalahari, pp. 40 ff., gives an account of the daily life of a Bushman family, which shows how completely true these statements are.

[399] Op. cit., p. 284. See also Stow, Native Races of South Africa, ch. v, for an account of their hunting methods.

[400] Quoted by Ratzel, op. cit., vol. II, p. 268. No reference is given.

[401] Schultze, op. cit., p. 653; Passarge, p. 17, states that "Feste Städteanlagen und politische Grenzen scheinen ganz zu fehlen . . . ."

[402] Fritsch, op. cit., p. 444.

conceive of anything more different from the East African culture. There are no cattle customs, for they have no desire to keep cattle. There is no political or settled and organized social life other than that of the "horde." Barrow mentions a village of twenty-five huts, but he saw only one such, and no one seems to have discovered another.[403] There are no milk taboos such as the East Africans manifest, nor are there apparently any occupations strictly limited to one sex, except hunting. This bare outline of Bushman culture is thus sufficient, to prove that it is basically dissimilar to that described in the previous chapter.

2.

The Hottentot, the second group from which the Bantu cattle-keepers are to be distinguished, inhabited in earlier times the region west of the Kafirs, Bechuana, and Matabele, exclusive of that portion of this territory occupied by the Bushmen. Through White oppression, they have shrunk to a handful, the best representatives remaining today living in Namaland. They are, or were, divided into three principal groups: the Namaqua Hottentot, the Koranas and the Griquas.[404] Along the west coast to the north, are the Ovambo and Ovaherero, Bantu peoples, whose cultures are similar to that of the Hottentot and East Africans, but who may be considered rather as transitional between their southern cattle-keeping neighbors and the Congo area to the north.[405] It is not so simple a matter to differentiate the culture of the Hottentots from that of the East African area as in the Bushmen case. A negative position is all that can be here assumed; and I will merely attempt to point out why placing the Hottentot in the East African cattle area would be unjustified. The Hottentot present many perplexing questions of distribution, which are problems in themselves, and into which it is impossible to inquire in this essay.

They have numerous cattle, which are of the utmost im-

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[403] Op. cit., p. 275; see also Fritsch, op. cit., p. 386.

[404] Stow, op. cit., p. 138.

[405] Ratzel, op. cit., vol. II, pl 463 ff., 538 ff.

portance to them.[406] The raids of the Bushmen on their herds has already been remarked. As in East Africa, a man's cattle sets his place in the group to which he belongs, and are the index of his richness. But there are differences between the general settings in which cattle are found among the two groups. In the first place, the general organization of the communities is different; that of the Hottentot is loose, unsettled, and not comparable to the well-organized, sedentary communities in all of East Africa. There is nothing like the complex political organization found in East Africa: the Hottentot lived in "hordes" and the ruler, if there was one, was the "captain." Again, the Hottentot did not rely on agriculture at all. In East African area the cattle complex, important as it is today, must be regarded as a cultural layer superimposed on an underlying agricultural stratum. In the southern portion of the area, agriculture is universally practised, and cattle serve more as a basis for invidious comparison than for food purposes, the use of milk to the contrary notwithstanding. Even in the northern portion, where the cattle complex reaches its greatest intensity, there are individuals, usually in a state of subjugation, who supply the herders with the vegetable food they wish. But among the Hottentot we find almost a pure herding culture. In the list of work done by men and women, Fritsch makes no mention of gardening; similarly Schultze mentions only cattle- and sheep-raising and hunting as their occupations.[407]

Further, the culture of the Hottentot is so dominated by the single economic fact of cattle-keeping that they have little of the sedentary life characteristic of the East African peoples. They live in small round huts, the frames made of poles bent together to make an inverted bowl, over which mats are thrown.[408] These huts are temporary, and the "horde" moves from place to place in search of proper feeding-ground for the cattle. A use of oxen which occurs nowhere in East Africa is their conversion into pack-

[406] Schultze, op. cit., p. 254 ff.; Amdersson, Lake Ngami, p. 256; Ratzel, op. cit vol. II, p. 289.

[407] Fritsch, op. cit., p. 323; Schultze, op. cit., p. 253 ff.

[408] See illustrations in Fritsch, vol. I, p. 317, fig. 61; Schultze, p. 228 ff. gives a detailed account of this type of hut, with illustrations.

animals; they are used to transport the effects of their owners. According to a much-quoted passage from Andersson:[409]

> When they move their habitations, these mattings and the framework of the hut, which consists of semicircular boughs, are packed on oxen. Their household utensils, such as calabashes, milk-pails, pots, etc., are suspended to the boughs, and in the midst of all this confusion is often seated the good dame of the house, surrounded by her promising offspring.

There may be recalled, on the other hand, the attitude already mentioned of the East Africans toward their cattle. The Ba-Ila, e.g., feel that it is unethical to make their cattle work, and this is not far from the general opinion. It has been comparatively easy, however, for the Hottentot to become the drivers of ox-carts for their Boer masters, for the custom is not in the least repulsive to their general cultural pattern.

The relation of women to cattle is also different in the two areas. Among a large number of East African tribes, women may not have anything to do with cattle. When they do care for them as frequently as not the men do the actual milking. The Hottentot women, however, care entirely for the cattle; the men do nothing but take them to their pasturage and bring them from it. Milk-drinking is often restricted in East Africa, as far as women are concerned, particularly at the time of puberty. Yet Barrow observed a custom whereby the girl at puberty is restricted to a milk diet,[410] though Fritsch records that menstruating women may not enter the kraal. The women do the actual milking, and the meat eaten by the women comes from different animals than that which the men eat.[411] Schultze also observes the difference:

> Während bei den viehhaltenden Bantustämmen Südafrikas das Melken Geschäft des Mannes ist, melken bei den Hottentotten regelmässig die Frauen und Mädchen, der Mann nur aushilfsweise. . . . .[412]

A milk custom never found among the Eastern Bantu, again, is the mixing of fresh milk with water for drinking purposes; it will be remembered that in all the East African area it is drunk mostly

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[409] Op. cit., p. 253.
[410] Op. cit., p. 163.
[411] Stow, op. cit., p. 272.
[412] Op. cit., p. 257.

soured, while diluted milk is never drunk, to the knowledge of the writer.[413] The Hottentot are avid meat-eaters, and their custom, of cutting meat of a carcass in long strips, throwing these on the fire, and eating them by placing one end of a strip in the mouth and gradually drawing it in, is also unknown in East Africa.[414] The general importance of women is much greater among the Hottentot than among the East African peoples. Schultze remarks on the greater power of the women in the household: how she may refuse the man details of the management of her house, while

> sie hat der Verwaltung der Vorräte unter sich, der Mann bittet Milch und sie gibt ihm.[415]

The importance of the inheritance customs noted in East Africa is lacking among the Hottentot. Stow makes no mention of them; Schultze remarks that he has no opinion, since he observed no cases. Ratzel briefly states:

> The first-born son is the only heir of his parents; other children have an ox or two, or a few sheep, given them when they marry.[416]

Fritsch devotes a brief paragraph to the subject: The oldest son is principal heir; failing sons, the nearest male relative inherits; daughters never inherit; the younger sons are dependent on the bounty of their elder brother, who may either give them enough cattle to make them independent, or allow them to live with him as subordinates.[417] At the death of a person, cattle are killed as a banquet to his friends and relatives.[418] In these customs we find points of resemblance to those of East Africa; there does not seem to be the detail worked out here which is noticed in the latter area, and there is presumably lacking that legalistic element of attention to all possible contingencies, which is so characteristic of the East African area. It is always possible, of course, that we are handicapped by insufficient reports of the Hottentot customs,

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[413] Fritsch also comments on this difference, p. 325.
[414] Theale, History and Ethnography of South Africa before 1795, vol. I, p. 39
[415] Op. cit., p. 299.
[416] Op. cit., vol. II, p. 291. No source for this statement is given.
[417] Op cit., p. 335.
[418] Andersson, op. cit., p. 257.

but the distinctions made above are tenable if based on the material at hand. In marriage, cattle are passed between the man and his proposed father-in-law, but not, apparently, as in East Africa. Andersson states that "an ox or cow is . . . . killed outside the door of the bride's home, and the ceremony is over,"[419] the consent of the girl's parents having been given first. Ratzel says that if a man's request for the daughter of another be favorably received,

> his people come next day to the bride's kraal with the oxen ordained for the wedding feast, and there slaughter them and arrange for the meal.[420]

Schultze also remarks this slaughtering of cattle at the marriage, and that each party to the match gives his or her mother-in-law a cow.[421] However, none of the observers record anything which parallels the careful systems to be noticed all through East Africa; there is no mention of divorce, though Fritsch remarks it among the Ama-Xosa in the same work in which he treats of the Hottentot.[422] The cattle given in marriage would seem to be only for a feast, and not for ensuring the good treatment of the wife and enriching her father, as is usually the case in East Africa.

It is seen, then, that despite the many resemblances which are to be observed between the cultures of the Hottentot and of the East African tribes, there are differences which make it unlikely that the two should be classed together. The differences in economic organization and character of the two cultures, in approach and importance attached to such similar phenomena as inheritance and the passage of cattle for one's wife, or milk-customs, all indicate that we are dealing with two cultures, which, though undoubtedly mutually influenced, cannot be regarded as analogous. There are numerous Bushman influences perceivable in the Hottentot culture, which have no place in East Africa, such as the high regard for women, the general nomadic character of the people, and the loose political organization. If the Hottentot culture be surveyed with regard to its neighbors, it may perhaps,

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[419] Op. cit., p. 257.
[420] Op. cit., vol. II, p. 291.
[421] Op. cit., p. 298.
[422] Op. cit., p. 113.

be said to be of the type termed "marginal": that it partakes of the culture on all sides of it, but does not show enough positive elements to be classed as an independent active culture.

3.

It is much less difficult to contrast the culture of the Congo. In the field of material culture, this has been done by Leo Frobenius[423] and the maps he provides as to the distribution of shields, dress, bows, houses, masks,[424] of human representations, pipes, tattooing, ornamentation, stringed instruments, wooden drums, knives,[425] and the use of the banana,[426] all show a striking unanimity over the region comprised in the basin of the Congo. He does not map, however, cultural elements comparable to those discussed in the preceding chapter, and a presentation of some of the differences in these elements between the two areas will serve to make the distinction even clearer.

Johnston, in speaking of the culture of the Congo area as a whole, remarks,

> Domestic cattle scarcely exist in North Congoland . . . . there are no cattle among the Nyamnyam, Mañbettu . . . . northern Mubangi, [nor] on the Aruwimi, though the instant the traveller leaves the watershed of the Congo to enter that of the Nile he will find . . . . oxen of the Galla type.[427]

The transposition from the one to the other is sufficiently startling. Schweinfurth noticed it, as has been quoted above.[428] The Bongo, according to him, depend entirely on agriculture for subsistence, though they do some hunting and a little fishing. Their only domestic animals are goats, poultry, and dogs. They are iron-workers, and throughout the Congo much more importance is placed on iron-working than is the case in East Africa. The Bongo use the hoe as the measure of value, and, in rough form, the metal is stored and treasured, for

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[423] Ursprung der Afrikanischen Kulturen.
[424] *Id.*, Karteblatt I.
[425] *Id.*, Karteblatt II.
[426] *Id.*, Blatt 4, Karte XXV.
[427] H. H. Johnston, Grenfell and the Congo, vol. II, p. 620.
[428] See p. 29.

it serves as well as the lance-heads and spades for cash and for exchanges, being available not only for purchases but for the marriage portions which every suitor is pledged to assign.[429]

The Niam-Niam, also, have no cattle, but are hunters and agriculturalists, the only domestic animals being dogs and poultry.[430] The Monbuttoo, also, are agricultural people, hunting for their meat, and being fond of goats, which they procure by raids, and which they do not breed but eat.[431] These tribes, it will be remarked, are just on the northern watershed of the Congo, and are neighbors of the Dinka, Shilluk and Nuer, all of whom have distinct cattle cultures. It may be true that this abrupt change is due to the fact that cattle cannot exist in the forest region, but there is an undeniable difference in cultures because of the absence of these animals. Thus, the importance of hunting and fishing is much greater in the Congo than among the East African tribes. The position of women among the Monbuttoo is much higher than among the cattle-owning tribes. There are, of course, none of the numerous milk-customs and milk-taboos of East Africa, and sour milk as an important article of diet is entirely absent. The daily routine of the individual presents a vastly different aspect: there is no herding or milking to be done, but the farm is the important thing, or hunting or fishing.

Farther inside the Congo region, there are the Bakongo. "Le Mukongo est exclusivement pecheur"[432] and he uses the river as his chief producer of food, though certain Azande, who have settled among this tribe, cultivate land on the left bank of the river.[433] Among the Bangala, agriculture is carried on on a small scale, for the fertility of the land and the climate make close cultivation unnecessary.[434] For domestic animals, they have chickens, dogs, goats and sheep, and they eat vegetable food, fish, and meat of all their domestic animals.[435] Milk is abhorred,

[429] Op. cit., vol. I, p. 279. All of ch. VII is devoted to a description of the Bongo.
[430] *Ibid.*, vol. II, pp. 1 ff.
[431] *Ibid.*, vol. II, ch. XV.
[432] Calonne Beaufaict, Etudes Bakongo, p. 53.
[433] *Ibid.*, p. 76 ff.
[434] Van Overburgh, Les Bangala, p. 173.
[435] *Ibid.*, p. 97 ff.

the person who drinks being regarded as unclean.[436] The woman supplies her husband with vegetable food while he gives her meat and fish; there is much pottery made by the women, while the men who work the iron are honored in the community. Unlike the case in most of East Africa, the produce of a woman's farm is her own, to dispose of as she wishes, and if she sells any of it her husband may not claim it.[437] Payment for a wife is in terms of male and female slaves, again in contrast to the overwhelming use of cattle for this purpose in East Africa.[438] The sheep, goats and chickens of the Warega are given no care; they may roam as they will, and must find their own food.[439] These people use no milk in any form. The dowry obtains here, as elsewhere in Africa, but the gifts given are other than animals. The money used consists of cowry-shells, but salt, iron and fabrics are similarly employed.[440] There is only slight division of labor,—the men work the fields with their women, but the iron-workers do no agriculture. The custom in East Africa of allotting the work in the fields to the women is seen to be different here.[441] The principal food of the Bushongo, in the heart of the Congo area, on the Kasai river, consists of corn and bananas. The domestic animals are dogs, which are used for hunting, and, at one time, there were goats. As among the Warega, no care is taken of these animals, nor of the chickens, but they must get their own food. A woman has her own fields, the crops of which belong to her although she must provide for her husband and children. In short, the women are held in higher regard than is common in East Africa:

> La situation sociale des femmes Bushongo est remarquable. Le premier personnage du royaume est une femme, la mère du roi. Parmi les grands du royaume, les femmes sont representées par deux personnages, et dans les conseils des anciens il y a de nombreuses femmes.[442]

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[436] Weeks, Anth. Notes on the Bangala of the Upper Congo River, Jour. Roy Anth. Inst., vol. XXXIX, p. 116.

[437] *Ibid.*, p. 129.

[438] *Ibid.*, pp. 440–441.

[439] Delhaise, Les Warega, p. 53.

[440] *Ibid.*, p. 313.

[441] *Ibid.*, p. 327.

[442] Torday and Joyce, Les Bushongo, p. 11.

Here, as elsewhere in the Congo, there are regular markets, a phenomenon rarely seen in the East African area. In these the cowry-shell is the medium of exchange; these are the tokens of wealth, and are given by the Mushongo to the parents of his wife as a dowry.

At the eastern edge of the Congo area, west of Lake Tanganyika, are found the Baholoholo, who call themselves the Baguha. It is of interest to note the respect in which this people differs from the cattle-keeping peoples north and east of the lake. Before the Europeans came, the chiefs had herds of cattle. These have gradually disappeared, until today there are to be found only a few goats and sheep.[443] Iron-workers are held in esteem, as in most of the Congo area, and agriculture is done by both men and women, the man working one more field than the greatest number worked by any of his wives.[444] The bride-price given at marriage is returnable if the wife be sterile or commit adultery, and if it is not returned, the man may sell his wife to recover the amount he gave for her, a custom distinctly not East African.[445] There would seem to be no trace of milk customs, nor any remnant of an earlier cattle-acculturation of any importance in the shape of special attention to domestic animals.

The few data presented are sufficient to demonstrate that the cattle-complex does not obtain in the Congo with respect to the cultural traits taken to show the cultural unity of the East African area. It is true that certain of the customs are similar. Thus, dowry is given to the parents of a bride by her husband, but this is a custom far from peculiar to Africa. The giving of cattle in East Africa, and of cowry-shells, hoes, and bark-cloth in the Congo, is the significant difference. There is the same legal organization, but the large number of cases involving cattle is lacking here. Wealth consists in the number of wives, or the amount of iron or shells owned, not in cattle. That the two areas cannot be considered as the same culturally, at least in the traits

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[443] Robert Schmitz, Les Baholoholo, p. 100.
[444] *Ibid.*, p. 107.
[445] *Ibid.*, p. 181.

dealt with in this essay, is patent; Frobenius' work shows the differentiation to hold for numerous other traits.

4.

To the north and northwest of the East African area lies the Sudan. The cultures of this region are bewilderingly numerous, and in its entire stretch from the Atlantic to the Red Sea, there are many differences. However, there are two principal streams of influence: that of the Mohammedan-Arabic culture from the north, and the Negro culture from the south. There will be no attempt made here, however, to delineate these various cultures. I will merely attempt to distinguish the culture of East Africa from that of the tribes of the Sudan bordering on it, and to show why they have not been classified with the peoples of the East African area. It will be remembered that at the north, the boundary was drawn at the position of the Shilluk, Dinka, Turkana, Suk, A-Kamba, and A-Kikuyu. North and northwest of the Shilluk and Dinka lie the Baggara Arabs and other tribes of Darfur and Kordofán, while to the east of these, and north of the Turkana, Suk, and A-Kamba are found the Galla, Somali and Danakil.

The Arab tribes west of the Nile exhibit distinct cultural differences from the East African tribes to their south. Tangye remarks on the variety of the cultures of this region, and the extent to which specialization is carried on:

> Particular tribes, such as those of Darfur and the nomads of the Bayunda desert, specialize in camel-breeding; the latter being famous for the swift hagen; the Baggara are noted for their cattle and horses, the Dongolese for their dates; . . . .[446]

Here, evidently, we have something distinct from that which obtains to the south. There is the multiplication of animals; the horse appears rarely, if ever, in East Africa, yet it is so important to the Baggara that accounts of their culture usually mention the tribe for their horses.[447] Camels, again, are found to have

[446] Tangye, In the Torrid Sudan, p. 8.

[447] MacMichael, The Tribes of Northern and Central Kordofán, p. 143; Gleichen, op. cit., pp. 190, 217.

much of the importance ascribed to cattle in East Africa. Particularly in Darfur and Kordofán, we find this is true:

> Camel-breeding is the principal pursuit of the Arabs in the north and east of Darfur, ... the Zeiadia, Maharia and Bedaiat are the principal breeders. The Arabs who breed camels occupy themselves with no other industry and have even to buy the corn used in their households, which with camels' milk satisfies all their wants.[448]

The Hamar of western Kordofán were large camel-raisers, according to Pallme, writing in 1838-1839:

> Camels for transport of troops were chiefly supplied by the Hamar, who at that time were the largest camel-owners of the country.[449]

In southern Kordofán, the Baggara, mentioned above, though they own horses, use their bulls for transporting their baggage when on the move.[450] Such a custom is found nowhere in East Africa.

The Kabâbîsh, an Arab nomadic tribe of northern Kordofán, will serve as an example of the life of this region. These people are the most powerful group there. They are divided into sections, and each *khasm biyut*, as these sections are termed, is under a sheikh.[451] As the dry season begins, each group sets out for a watering-place decided on by the leader. In this journey, the order of march is always the same: the cattle are driven first, then the camels ridden by the free women. After these are the baggage camels, while the men on their trotting-camels, superintend the movement. When the new encampment has been made, the tents stretch in straight rows along the wady, and there are [illegible]as for the horses. The wells are about a mile from the camp: the horses are watered every day, the goats and cows every third day, the sheep every fifth day and the few camels kept for convenience every ten days. Most of the camels, however, are sent far to the northwest to feed on the coarse grass, which remains green much longer than it does farther south. They remain there from

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[448] Gleichen, op. cit., p. 190.

[449] Quoted by MacMichael, op. cit., p. 29.

[450] Gleichen, op. cit., p. 179.

[451] C. G. and B. J. Seligman, the Kabâbîsh, a Sudan Arab Tribe, Harvard African Studies, vol. II, p. 112.

November until February, and are entirely without water during that period. The herdsmen subsist on camels' milk, and the little water and grain brought to them.[452] Blood-feuds exist, but are averted by the payment of blood-money; in theory this is one hundred camels, but it usually takes the form of about thirty oxen.[453] The women do little work, except in the Berara section, where there are few slaves. Here they draw water, grind durra, tend the cows and make the butter. But they never tend camels, and camels' milk is not supposed to agree with women. In the event of marriage, the "mahr," or bride-price, is disposed of differently than in East Africa. The father receives it, but it would be disgraceful if he touched it; it is turned over to the mother of the bride, who spends a part of it for her daughter's outfit, and gives the remainder to the bride. Inheritance of property is in the male line. Although men are the heirs, widows and daughters of the deceased expect a share of his property, and are usually given one or two female camels. These presents are the property of the woman; they are inherited by her children when she dies, but go to her brother if she dies childless, not to her husband.[454] During the dry season the Kabâbîsh subsist on a fair amount of meat. Sheep are only killed at the arrival of a guest, and camels only on important occasions, as at a wedding. A great deal of the grain needed by them is bought from neighboring tribes.[455] During the wet season, the khasm biyut breaks up and each member goes his own way to take best advantage of the grass which springs up everywhere, and which is good for his herds.[456]

It is evident that the culture of these tribes north of the East African area and west of the Nile is distinctly different from that discussed in the last chapter. There is little or no agriculture; the stress is on herding, but the stock is more varied than among the cattle-keeping people, who usually have only sheep and goats besides their cattle. The camel is a real factor in this northern

[452] *Ibid.*, pp. 117–120.
[453] *Ibid.*, p. 121.
[454] *Ibid.*, pp. 130–132.
[455] *Ibid.*, pp. 150–152.
[456] *Ibid.*, p. 117.

culture, and about that animal prohibitions center, while it is the one used in ceremonies.

Across the Nile, on the southern Egyptian border, there live the Ababdeh. They do not even own cattle, but raise only camels and sheep.[457] Far to the south, in the eastern horn of the continent, live the Galla, Somali and Danakil. Their southern neighbors are the Masai, Suk, and Turkana, and it is not a simple matter to differentiate the culture of the most southerly Galla from the tribes treated in the preceding chapter. They are, like the Masai, principally herders. According to New, they were in direct contact with the Masai, who continually raided them in order to take their cattle.[458] They are a purely pastoral people and what vegetable food they eat is obtained from neighboring peoples. They delight in fresh blood, and drink it mixed with milk. They use butter for anointing themselves.[459] There does not seem to be any taboo with regard to the contact of women with cattle: they

> milk the cows and sometimes help with the herding, and make butter, as well as manufacturing and cleaning the milk-vessels.[460]

They regard milking as distinctly the work of women, although natives are quoted as remarking " . . . . it may, on occasion, be done by men."[461] It must be remembered that these are the most southerly Galla, and as one proceeds northward the picture changes. There is additional emphasis on agriculture; Miss Werner remarks that the Abyssinian Galla differ so much from the southern Galla that it would be difficult to treat of them as one.

> . . . . to begin with, they are an agricultural people, which at once alters the whole aspect of their culture, and . . . . they have been perceptibly influenced by their Abyssinian surroundings.[462]

Paulitschke says

> Der Nordosten des afrikanischen Osthornes gehört den Nomaden, der Südwesten den Ansässigen. Der Südosten wird von Semi-Nomaden bewohnt,

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[457] Klunzinger, Upper Egypt, p. 259.

[458] New, Life in East Africa, pp. 202 ff.

[459] *Ibid.*, p. 72.

[460] Werner, The Galla of the East African Protectorate, Jour. Af. Soc., vol. XIII, p. 136.

[461] *Ibid.*, p. 130.

[462] *Ibid.*, p. 133.

die im Allgemeinen bei nassem Wetter westwärts zu ziehen pflegen, bei trockenem dann wieder gegen Osten oscilliren . . . .[463]

It seems to him that the Galla were first herders and later agriculturalists, and that the Somal tribes of Girri and Bertirri east of Harar are changing from shepherds to settled farmers, while there seem to be two types of Galla cultures, the herding with patriarchal institutions, and the agricultural with developed governmental institutions.[464]

In this Eastern Horn we find a multiplicity of domestic animals not to be seen farther south. Among the Somali and 'Afar there are sheep, goats, cattle, camels, donkeys, and horses, besides dogs, cats, and ostriches. The Oromo (Galla) have cattle, sheep, camels, donkeys, mules, goats, and pigs, as well as civet- and house-cats, and dogs.

Seiner Bedeutung nach steht bei den Nomaden in erster Linie das Kamel, dann folgt das Schaf, Pferd und Rind; beiden Sesshaften hinwider nimmt den ersten Rang das Rind ein, und diesen folgt zunächst das Maulthier, das Pferd und der Esel.[465]

The keeping of camels is important in all the territory of the Danakil and Somali as far as the marshy swamps of Webi Shabeli, which make it impossible to maintain them. The Somali camel is used for transportation and also valued for its milk. One sees herds of hundreds of them, watched by women. They are not ridden, but are kept for their milk, which is drunk sweet, and for their flesh, which is prized.[466] As has been noted, the more southerly Galla approach the East African tribes in their love for the cow. "Eine grosse Rinderheerde ist der Stolz des Oromó" is a remark made again and again about East African tribes also.[467] The horse is found among most of the Somali tribes as far south as Lake Rudolph. It, again, is an animal not seen farther to the south. The 'Afar have a few,—their country is that of the camel and the sheep. The ass is found in the entire East Horn, being

[463] Paulitschke, Ethnographie Nordost-Afrikas, vol. I, p. 210.
[464] *Ibid.*, vol. I, pp. 210–212.
[465] *Ibid.*, vol. I, p. 223.
[466] *Ibid.*, vol. I, pp. 223–224.
[467] *Ibid.*, p. 226.

used by the Galla as a pack-animal.[468] The pig is found only among the Galla; since Islam does not countenance it, it stops at the southern limit of Mohammedanism. Here, as elsewhere, the bride-groom must give dowry for his bride. The western Somali and 'Afar give from ten to one hundred and fifty female camels in milk, ten to one hundred horses, and two to three hundred sheep; the poorer man gives only ten to twenty goats. The Galla farther to the south give from six to eighty cows.[469] At marriage, the father gives his daughter a present amounting to several cows and goats, so that she will always have food.[470] As is so often found to be the case in pastoral family, "le systeme d'heritage chez les Oromo se base sur le droit absolu de l'âiné."[471] He must, however, provide for his younger brothers and take care of his sisters, who, however, inherit nothing. Among the Mijjertheyn Somali the bride-price was paid in thalers,—one hundred and fifty was often the amount.[472] These Somali are divided into two groups, the townspeople and the Bedouins. The wealth of the latter is in camels, horses and sheep, and they gather mountain gums, selling them to the townspeople. They live almost entirely on milk, and are all Mohammedans.

It is interesting to notice the gradual change in the culture of the people north from Lake Rudolph. Slightly south of this lake, we find the Masai, the Suk, and the Turkana, all tribes in which the cattle complex operates at its highest. Almost all the elements of the complex are found in the southern Galla: the responsibility of the women toward the cattle is slightly stressed, but that is all. As we proceed to the north and east, other animals are introduced, and the culture takes on more and more, on the one hand, the elements of that of a desert nomadic people, or, among the Abyssinian Galla, those of an agricultural people. There have been mentioned the Ababdeh, much farther to the north, who have no cattle at all, but only camels and sheep. Between the extremes of

[468] *Ibid.*, p. 228.

[469] *Ibid.*, pp. 196–197.

[470] de Salviac, Les Galla, p. 214.

[471] *Ibid.*, p. 236.

[472] Crittenden, Notes on the Mijjertheyn Somalees, Jour. Asiatic Soc. of Bengal, vol. XIII, part 1, pp. 319–335; Paulitschke places the price as high as a thousand thalers.

this tribe and of the Masai, there is a gradual shading. It is a striking demonstration of the shading which takes place in cultural traits as we pass from one area to another when there is no strongly prohibiting environmental factor, as there is on the western border of the East African area, between it and the Congo.

IV

The cattle complex of East Africa includes a number of definite traits confined, more or less, to the territory comprised in the area described. If found outside the area, they are usually seen in a setting different from that of East Africa. Reviewing these traits, we find as the outstanding one the existence of cattle. These animals are found in all the area, and if less frequent in some places it will be found that those which are present exert an influence greater in proportion to their numbers. Thus the Wa-Giriama have not many cattle, yet the dowry always includes cattle, and these are the animals slaughtered at ceremonies. In all of East Africa, cattle constitute wealth. A man may have iron, produce from his fields, sheep and goats, implements of all kinds, but unless he has cattle, his wealth amounts to nothing. On the other hand, the man who has position in his community is he who owns the largest herds, and most of the incentive to raiding or other means of acquisition of these animals is simply the urge for power and prestige.

At birth, in death, and at marriage, cattle are present, customs connected with them are usually in evidence. In the south, the newly-born child carried a necklace of several hairs from the tail of a special cow for a good-luck charm, while in the north it is the rope used to tie the feet of restless cattle at milking-time which binds the waist of the new mother. The custom of burying the dead in the skin of a cow or of an ox is ubiquitous in the area. In several tribes special oxen are kept to be killed at the death of their owner, while the funerary feast consists of the flesh of cattle wherever the estate of the deceased person is sufficient to afford this. The only acceptable dowry, in the overwhelming number of cases, consists of cattle, and their passage determines the family to which the children born of the match belong. In divorce, the

principal question is usually the disposal of the dowry-cattle, whether they are to be returned to the husband or remain with the father of the wife. Finally, it is because of these important customs that an appreciable portion of the work of the judicial bodies is concerned with cases involving cattle.

It is on this cultural fact, then, that the grouping of the tribes of this region is based. Such a grouping has been termed a culture-area, and, as pointed out above, has been made for America, but for no other continent. It is a concept which has owed its inception and development to the fact that specimens of material culture tend to fall into well-defined groups, and that museum methods have shaped this tendency to place similar objects together. It is interesting to see the extent to which these non-material elements of culture follow the same rules, and to consider the principles which should underlie this culture-area concept. It seems that the culture-area is based empirically on the outstanding elments in the cultures of a given region. Thus, in America, the tribes inhabiting the Plains area are hunting peoples; their weapons, habitations, means of getting a living, and the like, are based on this fact, and their cultures therefore resemble each other to a much greater degree than they do those of the Southwest, inhabited by peoples whose culture is basically agricultural. From the survey just made the same is true of Africa. The basis of wealth is cattle, which supply an appreciable portion of the food of the East African tribes, and constitute one of the most noticeable elements in their culture. The presence of these animals differentiates Eastern peoples from those who have no cattle, and, on the other hand, from those who have cattle and additional animals.

The culture of East Africa gives the impression of having an agricultural foundation, on which the cattle complex seems to have been superimposed. There is no tribe in which some agriculture is not performed; though in the north the dominant groups do not work the ground, they feel dependent upon the subordinate elements of the population for their vegetable food. It has not been possible for the writer to obtain a zoological classification of African cattle, but two types are easily distinguishable. In the

extreme south, among the Hottentot, Zulu, and other peoples south of the Zambesi, and in the north among the Galla of Abyssinia, the tribes of the Egyptian Sudan and to the west, there are to be found the large, straight-horned variety. Between these two widely separated regions, we find the smaller, humped, short-horned cattle, such as were raised in ancient Egypt. It has been claimed that this is the type found in India,—if this be true, the conclusion would be tempting that the cattle of Africa were derived from the north, and that they were introduced into this agricultural society in prehistoric days. This, however, presents difficulties, for it leaves the other type of cattle to be accounted for. If it be argued that they are indigenous, then they must have spread from the north to the south or from south to north. In either case, it is strange that there is the wide gap in their distribution. A third possibility, that they originated in the center of the eastern portion of the continent and diffused in both directions is logically conceivable but most unlikely, for it is in the central area between the two outlying regions that the cattle-complex is found to be weakest. This might, however, be accounted for by climatic change over a long period of time. Another suggestion is that this type of cattle might be a mutation of the dew-lap variety. But considering the extreme improbability that the same variation should happen twice in the comparatively short time cattle could have been in Africa, this must also be rejected. And although a single occurrence of the mutation is quite possible, this again leaves the problem of the gaps in distribution of the straight-horned cattle in as perplexing a state as before. Perhaps the most that may be said is that the evidence from contemporary peoples suggests that cattle were introduced in a civilization already in full possession of agricultural technique.

But it is the cattle that have become the dominant element in the cultures of these peoples. Yet, in the determination of a culture-area, the presence of the dominant trait is not everything. It is the extent to which this trait has gathered about it a complex of other traits which makes possible the mapping of an area. It may be said that there are no elements of culture which are found among one people only; it may similarly be said that there is no

element which does not affect some other element in the culture of which it is a part. It is these outstanding traits that seem to affect most deeply the other traits composing the entire culture. This stands out very clearly in Wissler's study of the spread of the horse in North America. There was a definite horse complex, which carried with it the saddle, the knowledge of the care of the horse, and other elements. The spread of this trait through the plains was rapid, and it affected other elements of culture. The travois, e.g., which had been used with the dog, was immediately transferred to the horse. Another example of this is found in the spread of tobacco in Africa. Introduced in historical times, it diffused with amazing rapidity throughout the continent, and such arts as pottery-making and wood-carving responding to it, as any collection of pipes from Africa will demonstrate. The same is true of cattle, though to a greater degree. They gathered about them these other elements of the complex, until we can recognize it wherever it may be found. Cattle as wealth, cattle as the only acceptable dowry, cattle as the proper animals to be used in ceremonies or at special feasts, cattle associated with distinct sex or occupational taboos, special milk customs,—these all have distributions which are very similar. It is not enough that cattle be found in East Africa to constitute it an area; before the region may be distinguished there must be a series of traits, all of which taken together have a similar distribution, and which show an interrelation.

This does not mean, however, that the individual traits which comprise the complex are fixed, as the Graebnerian school would have us believe. Indeed, the capriciousness of many of them is apparent, and their distribution cannot be observed without remarking this character. Taking the major element of the cattle complex, the cattle themselves, we find that they are found throughout the Sudan, the south of the continent, and on the west coast, as well as in East Africa. But it does not follow that all these regions are culturally comparable. In the Sudan, for example, cattle are subordinate to other animals, such as the camel or the horse. Among the Hottentot, they dominate life to so much greater an extent than in East Africa that the two

cultures appear to be greatly different. Agriculture, not an element in the cattle complex except through its subordination to herding where cattle are found, is distributed all over Africa except in the territory of the Hottentot and Bushmen, and those northern desert regions where climatic conditions make it impossible. But while agriculture is the dominant element in the economic life of the Congo, we do not find this to be the case in East Africa. Again, the custom of giving dowry for one's wife is found all over Africa, to say nothing of other continents. But while in East Africa cattle are given and strict rules hold as to their disposal in the event of divorce or the wife's barrenness, we see in the Sudan that the dowry principally takes the form of camels. Nor is the disposal the same,—it is a disgrace for the father of the bride in this latter region to keep any of the dowry for himself. In the Congo area, cowry-shells and iron hoes are given the girl's father by her prospective husband, while in the south of the continent, among the Hottentot and Bushmen, little or nothing is given. Again in the case of inheritance, it is cattle which form the major portion of the estate in East Africa. This is not true in other regions. So one might detail the list of traits which distinguish East Africa, and plot differing distributions for each of them; it is their being all found together just in this region which is of significance.

There may be no correlation between the territory of the culture-area and the distribution of traits found there which are not included in the dominating complex. An area plotted on the basis of the cattle complex will give vastly different results from one plotted on that of political organization, for example. Among the Baganda, the Bahima and Banyoro, we find political organization which points strongly toward the Congo; the separate courts of the king, queen and queen-mother, the hierarchy of nobility and priesthood, and all the vast machinery of a constituted government over a large area, the counterparts of which one can find among the Bushongo of the Kasai river region, in the heart of the Congo area. Language is another cultural trait which seems to be completely independent of other aspects of culture. It cannot be denied, of course, that the cattle complex exerts a slight

influence over language in East Africa, but only to the extent to which language must be a means of expressing the daily life of the people who use it. It is to be expected that we find among cattle-owning tribes, the large number of words used to describe cattle to the minutest detail, or that among the Suk, e.g., there is a separate stem for a milk calabash as distinguished from an ordinary one. But language as such is quite without any bounds of culture-areas. In the larger portion of East Africa, Bantu is spoken. But to the north, there is also found the so-called "Nilotic" group of languages—Nandi, Suk, Masai, Silluk, and others. In the very heart of the East African region, apparently quite isolated, there is found a language which has all the clicks of Hottentot, and is spoken by the Sandawe. Yet these people, living south of the Masai, exhibit the cattle complex,—they have cattle, drink their milk soured, and use the blood of their animals, much as do their neighbors. There is apparently no relation between the language of these areas and their cultures;—another example of this is manifest in the fact that the language of the Congo, Bantu, is that of most of East Africa.

It cannot be imagined, after the foregoing exposition, that the transition from one culture-area to another need be abrupt. In the general nature of things, this is not the case. An example of the way in which one culture may shade into another has been remarked in the last chapter. It will be remembered that the southern Galla resemble the Masai in many respects, almost in all of those constituting the cattle-complex. The placing of the boundary is indeed a most difficult matter here, and it is only the fact that exact transition-points between the southern and northerly Galla are so difficult to establish that has led to the exclusion of the southern Galla from the East-African area. We find a gentle transition from the cattle-culture to a camel- or an agricultural-cattle-camel-culture. The situation is otherwise in the case of the dividing-line between the Congo and East Africa. There can be no doubt where this line should lie; it follows the water-shed of the Congo with startling faithfulness. This brings us to another point in the consideration of the causes of this grouping of cultural traits: the influence of the environmental

element. If a map of the annual mean rainfall of Africa be consulted[473] it will be noticed that the line bounding the area in which sixty inches of rainfall a year follows closely this northwestern boundary of the East African area. It has been pointed out that this is also the northeastern watershed between the Congo and Nile rivers, yet there is no abrupt change in the configuration of the land. This amount of rainfall, however, determines the forest-belt within which cattle do not thrive, and in which the most luxuriant vegetation abounds. It is also of interest that there is a slight extension of this area to Uganda, where it has been found that the cattle complex is merged with many elements of the Congo culture, such as the prominence of the bark-cloth and the cowry-shell. Further, the weakness of the cattle-complex in the narrow central portion of the East African area is undoubtedly determined by the fact that this region contains districts in which the tse-tse fly abounds. It is not maintained that this environmental fact of rainfall, e.g., determines the culture of the Congo or of East Africa, or the variations which occur in Uganda. But here we evidently have a demonstration of the rôle of environment as a limiting factor to the spread of culture, for, if cattle cannot be maintained beyond a certain point, there is no opportunity for a cattle culture to develop.

It is well to consider the point of most intense development of the culture of the area which has been denoted. If the center of a culture-area is that in which the greatest number of manifestations of a given culture are seen, then the region about Lake Victoria Nyanza, excluding Uganda, must be selected. Among the Zulu and Kaffir tribes in the south we find that the cattle complex manifests itself almost as prominently. But the complete absorption in cattle distinctive of the northern region, seen in such matters as the appointment of a chief to rule over a given number of cattle rather than of people, in the elaborate cattle rituals which surround the chief, in the time given to herding as against that devoted to anything else, leads one to place the center there. It must not be assumed that the culture-center is an historical

[473] Knox, The Climate of the Continent of Africa, Plate I.

concept, for it is not claimed that the diffusion either of the cattle themselves or of cattle traits took place from this region. But that there is the most complete cattle-culturation here, must be apparent from the material adduced.

We may then come to the conclusion that a culture-area is an empirical grouping of tribes which manifest similar cultures; that, being descriptive, it is a picture which does not necessarily include time-depth; that its boundaries are not fixed, but that there is a shading from the culture of one area to that of the next, geographical conditions permitting; that the complex of traits which compose the culture of an area are distributed, in the main, throughout that area, and that the area comprises the region in which they are to be found in similar cultural settings; that the elements of these complexes are not invariably fixed, but may have individual distributions; and that, finally, the significance of the traits in the complex of an area are the same to the inhabitants of that area. In the light of this concept of the culture-area, the distribution of the cattle complex in East Africa demonstrates its applicability to African cultures, and points the way to delineation of other areas which have not as yet been denoted.

BIBLIOGRAPHY

* Those titles starred are the ones to which actual reference has been made in the body of the work. Those not starred have general consultative value.

*ANDERSSON, CHARLES JOHN: Lake Ngami, or Explorations and Discoveries during Four Years' Wanderings in . . . . Southwest Africa. New York, 1857.

———, Notes of Travel in Southwest Africa, New York, 1855.

*ANKERMAN, B.: Kulturkreise und Kulturschichten in Afrika, Zeitschrift für Ethnologie, vol. XXXVII, (1905), pp. 62 ff.

———, Die Lehre von den Kulturkreisen, Korrespondenz-Blatt der Deutscher Gesellschaft f. Anth. Eth., und Urgeschichte, vol. XLII (1911) Braunschweig, pp. 156–162.

AVON, LE REV. PÈRE: Vie sociale des Wabende au Tanganyika, Anthropos, vol. X-XI, (1915–1916), pp. 98–113.

BAINES, THOMAS: Explorations in Southwest Africa, being an account of a journey in . . . . 1861 and 1862 from Walfisch Bay . . . . to Lake Ngami and Victoria Falls, London, 1864.

*BARRETT, CAPT. W. E. H.: Notes on the Customs and Beliefs of the Wagiriama, etc., British East Africa. Journal of the Royal Anthropological Institute, vol. XLI, (1911), pp. 20–39.

*BARROW, JOHN: An Account of the Travels into the Interior of Southern Africa in the years 1797 and 1798, etc. London, 1801.

*BEAUFAICT, A. DE CALONNE: Études Bakongo, Liége, 1912.

*BEECH, MERVYN W. H.: The Suk, their Language and Folklore, Oxford, 1911.

———, *Sketch of Elgeyo Law and Custom, African Society Journal, vol.xx, pp. 195 ff.

BÉGUISSE, EUGÈNE: Les Ma-Rotsé,—étude geographique et ethnographique du Haut-Zambèze, Lausanne, 1903.

BENEDICT, RUTH FULTON, The Concept of the Guardian Spirit in North America. Memoirs Am. Anth. Ass'n, No. XXIX.

BOAS, FRANZ: The Methods of Ethnology, American Anthropologist (N. S.) vol. XXII, (1920), pp. 311–321.

———, Review of Graebner's "Methode der Ethnologie," Science, vol. XXXIV (n. s., 1911), pp. 804–810.

BROWN, A. S., AND BROWN, G. G., The Guide to South Africa, edited annually, 1903-1904 (11th) edition, London and Cape Town. (For maps.)

BUSCHAN, DR. GEORG: Illustrierte Völkerkunde. Bd. i, pp. 428-612.

*CALLAWAY, BISHOP C.: Zulu Nursery Tales, vol. I, London, 1868.

CAMPBELL, DUGALD: In the Heart of Bantuland, London, 1922.

*CAPE OF GOOD HOPE, Report and Proceedings with Appendices of the Government Commission on Native Laws and Customs, Cape Town, 1883.

*CASALIS, E.: Les Bassoutos, ou vingt-trois anñées de séjour et d'observations au sud de l'Afrique, Paris, 1859.

CERULLI, ENRICO: Folk-Literature of the Galla of Southern Abyssinia. Harvard African Studies, Cambridge, vol. III (1927), pp. 9–229.

CHAMPION, ARTHUS M.: The Atheraka. Jour. Roy. Anth. Inst., vol. xlii (1912) pp. 68-90.

CHANTRE, ERNEST: Recherches anthropologiques dans l'Afrique Orientale.—Egypte. ———(ch. iii, iv.) Lyon, 1904.

*CLAUS, HEINRICH: Die Wagogo, Ethnographische Skizze eines ostafrikanischen Bantustammes. Baessler-Archiv, Beiheft II, 1911.

CLAUS, ———: Die Wangomwia. Zeitschrift f. Eth., vol. xlii (1910) pp. 489-497.

COLE, REV. HENRY: Notes on the Wagogo of German East Africa. Jour. Roy. Anth. Inst., vol. xxxii, (1902) pp. 305-338.

*CONDER, C. R.: The Present Condition of the Native Tribes in Bechuanaland. Jour. Anth. Inst., vol. xvi, (1886-1887) pp. 76-96.

CONDON, FATHER M. A.: Contribution to the Ethnology of the Basoga-Batamba, Uganda Protectorate, B. E. A. Anthropos, vol. v, (1910) pp. 934-956, and vol. vi, (1911) pp. 366-384.

*COXHEAD, J. C. C.: The Native Tribes of North-eastern Rhodesia: their Laws and Customs. Roy. Anth. Inst., Occasional Papers, no. 5. London, 1914.

*CRITTENDEN, LIEUT. C. J.: Notes on the Mijjertheyn Somalees. Jour. Asiatic Soc. of Bengal, vol. xiii, part i, pp. 319-335. Calcutta, 1844.

CUMMINS, S. L.: Sub-tribes of the Bahr-el-Ghazal Dinkas. Jour. Roy. Anth. Inst., vol. xxxiv, pp. 149-166.

CUNNINGHAM, J. F.: Uganda and its Peoples,—notes on the protectorate of Uganda, especially the anthropology and ethnology of its indigenous races. London, 1905.

D'ABBADIE, ANTOINE: Sur les Oromó, grande nation africaine, designée souvent sous

le nom de Galla. Annales de la Societé Scientifique de Bruxelles, vol. iv, (1880), pp. 162-188.

*DELHAISE, LE COMMANDANT: Les Warega (Congo Belge). Collection de Monographies Ethnographiques, ed. par Cyr. van Overbergh. Bruxelles, 1909.

DEMPWOLFF, OTTO: Beiträge zur Volksbeschreibung der Hehe. Baessler-Archiv, vol. iv (1913-1914), pp. 87-163.

*———: Die Sandawe, Linguistisches und Ethnographisches Material aus Deutsch Ostafrika. Abhandlungen des Hamburgischen Kolonialsinstituts, Bd. xxxiv.

*DOWD, JEROME: The Negro Races, a sociological Study vol. i, New York, 1907, vol. ii, New York, 1914.

*DRIBERG, J. H.: The Lango, a Nolotic Tribe of Uganda. London, 1923.

*DUNDAS, HON, CHARLES: Native Laws of some Bantu Tribes of East Africa. Jour. Roy. Anth. Inst., vol. li (1921), pp. 217 ff.

*———: History of Kitui. Jour. Roy. Anth. Inst., vol. xliii (1913), pp. 480-549.

DUNDAS, HON., CHARLES: Kilimanjaro and its people. London, 1924.

DUNDAS, HON. K. R.: Notes on the Tribes inhabiting the Baringo District, East African Protectorate. Jour. Roy. Anth. Inst., vol. xl (1910) pp. 49-72.

*———: The Wawanga and other tribes of the Elgon District, British East Africa, Jour. Roy. Anth. Inst., vol. xliii (1913) pp. 19-75.

*EICHHORN, AUGUST: Beiträge zur Kenntnis der Waschambaa,—nach hinterlassenen aufzeichnungen von A. Karasez. Baessler-Archiv, Bd. i (1910), pp. 155-226, Bd. iii (1912-1913), pp. 67-131.

*FRITSCH, GUSTAV: Die Eingeborenen Süd-Afrika's. 2 vol. Breslau, 1872.

FROBENIUS, LEO UND VON WILM, RITTER: Atlas Africanus, erste lieferung. München, 1921.

*FROBENIUS, LEO: Der Ursprung der Afrikanischen Kulturen. Berlin, 1898.

*———: The Origin of African Civilisations. Annual Reports of the Smithsonian Institution, 1898, pp. 637-651.

*———: The Voice of Africa, ... an account of the travels of the German Inner African Exploration Expedition in . . . . 1910-1912. 2 vol., transl. by Rudolf Blind. London, 1913.

*FERGUSSON, CAPT. V. H.: The Nuong Nuer. Sudan Notes and Records, vol. iv, pp. 146 ff.

*GLEICHEN, LT.-COL. COUNT: The Anglo-Egyptian Sudan: a compendium prepared by officers of the Sudan Government. vol. i, Geographical, Descriptive, and Historical. London, 1905.

*GOLDENWEISER, A. A.: The Principle of Limited Possibilities in the Development of Culture. Jour. American Folklore, vol. xxvi, (1913), pp. 259 ff.

———, Early Civilization, New York, 1922.

———, Four Phases of Anthropological Thought: an Outline. Publications of the Amer. Sociological Society, vol. xvi (1921) pp. 50-69.

*GOULDSBURY, CULLEN, AND SHEANE, HULBERT: The Great Plateau of Northern Rhodesia: some impressions of the Tanganyika Plateau. London, 1911.

GOULDSBURY, C.: Notes on the Customary law of the Awemba and Kindred Tribes, African Society Journal, vol. xiv, pp. 366 ff., vol. xv, pp. 36 ff., 157 ff.

*GRAEBNER, F.: Methode der Ethnologie. Heidelberg, 1911.

*———, Die melanesische Bogenkultur und ihre Verwandten. Anthropos, vol. iv, (1909), pp. 726-780, 998-1032.

*GROVE, CAPT. E. T. N.: Customs of the Acholi. Sudan Notes and Records, vol. ii, (1919) pp. 157-182.

*HABERLANDT, M.: Zur Kritik der Kulturkreislehre. Korrespondenzblatt der Deutschen Ges. f. Anth., Eth., und Urgeschichte, vol. xii (1911), Braunschweig, pp. 162-165.

*HAGEN, GUNTHER VON: Die Bana. Baessler Archiv, Bd. ii (1911-1912), pp. 77-116.

———, Einige Notizen über die Musgu. Baessler Archiv, Bd. ii, 1911-12, pp. 117-122.

*HAHN, THEOPHILUS: Die Buschmänner in Südafrika. Globus, Bd. xviii (1870), pp. 65, 81, 102, 120, 140, 153.

———, Die Nama-Hottentoten. Golbus, Bd. xii (1867), pp. 238, 275, 304, 332.

HARTLAND, E. SIDNEY: Review of Graebner's "Methode der Ethnologie," Man, vol. xiv (1914) No. 70, pp. 139 f.

HARTMANN, R.: Les Peuples de l'Afrique. Bibliothèque Scientifique Internationale, vol. xxxiv. Paris, 1880.

*HERSKOVITS, M. J.: Some Property Concepts and Marriage Customs of the Vandau. Amer. Anth., (n.s.) vol. xxv (1923), pp. 376-387.

———, A Preliminary Consideration of the Culture Areas of Africa. Amer. Anthr., (n.s.) vol. xxvi (1924), pp. 50-64.

HILTON-SIMPSON, M. W.: Lands and Peoples of the Kasai, being a narrative of a 2 years' journey among the cannibals of the equatorial forest and other savage tribes of the south-west Congo. London, 1911.

*HOBLEY, C. W.: The Ethnology of the A-Kamba and other East African Tribes. Cambridge, 1910.

———, Eastern Uganda, an ethnological survey Anthropological Institute, Occasonal Papers, no. 1. London, 1902.

———, Bantu Beliefs and Magic, with particular reference to the Kikuyu and Kamba tribes of Kenya colony. . . . . London, 1922.

———, British East Africa,—Kikuyu Customs and Beliefs. Thahu and its connection with circumcision rites. Jour. Roy. Anth. Inst., vol. xl (1910), pp. 428-452.

*HOLDEN, WILLIAM C.: The Past and Future of the Kaffir Races. London, 1866.

*HOLLIS, A. C.: The Masai, their Language and Folklore. Oxford, 1905.

*———, The Nandi, their Language and Folklore. Oxford, 1909.

———, A note on the Masai System of Relationship and other Matters Connected therewith. Jour. Roy. Anth. Inst., vol. xl (1910) pp. 473-482.

*JENKINSON, THOMAS B.: Amazulu. The Zulus, their Past History, Manners, Customs and Language. . . . . London, 1882.

*JOHNSTON, SIR HARRY H.: British Central Africa, London, 1897.

*———, George Grenfell and the Congo. 2 vol. London, 1908.

*———, The Uganda Protectorate. 2 vol. New York and London, 1902.

———, A Survey of the Ethnography of Africa, and the former Racial and Tribal Migrations in that Continent. Jour. Roy. Anth. Inst., vol. xliii (1913), pp. 375-412

———, On the Races of the Congo and the Portuguese Colonies in West Africa, Jour. Anth. Inst., vol. xiii (1883-1884), pp. 461-479.

*JUNOD, HENRI A.: The Life of a South African Tribe. 2 vol. Neuchatel, 1913.

———, Les Ba-Ronga. Bull. de la Societe Neuchateloise de Geographie. Tome x, 1898.

KAY, STEPHEN: Travels and Researches in Caffraria. . . . . New York, 1834.

*KIDD, DUDLEY: The Essential Kaffir. London, 1904.
*KLUNZINGER, E. B.: Upper Egypt: its people and its products. New York, 1878.
*KNOX, ALEXANDER: The Climate of the Continent of Africa. Cambridge, 1911.
KOETTLETZ, R.: Notes on the Galla of Walega and Bersat. Jour. Roy. Anth. Inst., vol. xxx (1900) pp. 50-55.
*KOLLMAN, PAUL: The Victoria Nyanza, The Land, the Races and their Customs, with Specimens of some of the Dialects. London, 1899.
KROEBER, A. L.: California Culture Provinces. Univ. of California Publications in American Archaeology and Ethnology, vol. xvii, No. 2, pp. 151-169. Berkeley, 1920.
———, Review of Wissler's "American Indian." American Anthropologist, vol. xx (n.s., 1918) pp. 203-209.
*LESLIE, DAVID: Among the Zulus and Amatongas. Glasgow, 1875.
*LINDBLOM, GERHARD: The Akamba, an Ethnological Monograph. Inaugural Dissertation, University of Upsala. Upsala, 1916.
LINDBLOM, G.: The Akamba in British East Africa. 2nd ed. enlarged. Uppsala, 1920. (Arch. d'Etudes Orientales, vol. xvii.)
*LOGAN, COL. M. H.: The Beirs. Sudan Notes and Records, vol. i (1918), pp. 238-248
*LOWIE, R.: On the Principle of Convergence in Ethnology. Jour. Amer. Folklore vol. xxv (1912), pp. 24 ff.
———, Review of Sapir's "Time Perspective in American Culture." Amer. Anth., vol. xxi (1919), pp. 75-77.
*MACDONALD, REV. DUFF: Africana, or the Heart of Heathen Africa. London, 1882.
*MACLEAN, COL.: A Compendium of Kafir Laws and Customs .... compiled by Mount Coke, 1858.
*MACMICHAEL, H. A.: The Tribes of Northern and Central Kordofán. Cambridge, 1912.
MAUD, CAPT. PHILIP: Exploration in the Southern Borderland of Abyssinia. Geographical Journal, vol. xxiii, (1904), pp. 552-579.
MAUGHAM, R. C. F. Zambezia, a general description of the valley of the Zambezi .... with its .... ethnography. London, 1910.
*MEINHOF, CARL: Afrikanische Rechtsgebräuche. Berlin, 1914.
*MERKER, M.: Die Masai, Ethnographische Monographie eines Ostafrikanischen Semitenvolkes. Berlin, 1904.
*NEW, CHARLES: Life, Wanderings and Labours in East Africa. London, 1873.
NORTHCOTE, G. A. S.: The Nilotic Kavirondo. Jour. Roy. Anth. Inst., vol. xxxvii (1907), pp. 58-66.
O'SULLIVAN, H.: Dinka Laws and Customs. Jour. Roy. Anth. Inst., vol. xl, (1910) pp. 171-191.
*PASSARGE, S.: Die Buschmänner der Kalahari. Berlin, 1907.
*PAULITSCHKE, PHILIPP: Ethnographie Nordost-Afrikas. vol. i, Die Materielle Kultur der Danâkil, Galla, und Somali. Berlin, 1893.
PERRY, W. J.: The Children of the Sun.
PHILIP, REV. JOHN: Researches in South Africa, illustrating the Civil, Moral and Religious Condition of the Native Tribes. 2 vol. London, 1828.
PLAS, JOSEPH VAN DEN: Les Kuku. n°. vi, Collection des Monographies Ethnographiques. Bruxelles, 1910.
*RATZEL, FRIEDERICH: The History of Mankind. vol. 2, p. 237 to vol. 3, p. 145. London, 1896.

RAYNE, H.: Somal Tribal Law. African Society Journal, vol. xx, pp. 101 ff.
———, Somal Marriage, African Society Journal, vol. xxi, pp 23 ff.
*REHSE, HERMANN: Kiziba, Land und Leute. Stuttgart, 1910.
RIVERS, W. H. R.: Review of Wissler's "American Indian." Man, vol. xix (1919), No. 39, pp. 75-76.
RIVERS, W. H. R.: The Loss of Useful Arts. Westermark Anniversary Volume, 1912.
———, The Contact of Peoples. In Essays and Studies Presented to William Ridgeway 1923.
*———, Aims of Ethnology, Psyche, vol. iii. No. 2 (1922) pp. 118-132.
*ROSCOE, JOHN: The Baganda, an Account of their Native Customs and Beliefs. London, 1911.
*———, The Northern Bantu, an account of Some Central African Tribes of the Uganda Protectorate. Cambridge, 1915.
*———, The Bahima: a Cow Tribe of Enkole in the Uganda Protectorate. Jour. Roy. Anth. Inst., vol. xxxvii (1907), pp. 93-119.
*ROUTLEDGE, W. AND K.: With a Prehistoric People. The Akikuyu of British East Africa. London, 1910.
*DE SALVIAC, P. MARTIAL: Les Galla, un peuple antique au pays de Ménélik .... grande nation africaine. Paris, 1901.
*SAPIR, E.: Time Perspective in Aboriginal American Culture, a Study in Method. Canada, Dept. of Mines, Geological Survey, Memoir 90, Anth. Series No. 3. Ottawa, 1916.
*SCHMIDT, P. W.: Kulturkreise und Kulturschichten in Südamerika. Zeit. f. Ethnologie vol. xiv, pp. 1014 ff.
*SCHMITZ, ROBERT: Les Baholoholo. n°. ix, Collection de Monographies Ethnographiques. Bruxelles, 1912.
*SCHULTZE, LEONHARD: Aus Namaland und Kalahari. Jena, 1907.
*SCHWEINFURTH, DR. GEORG: The Heart of Africa. Three Years' Travel and Adventures in the Unexplored Regions of Central Africa, from 1868 to 1871. Transl. by Ellen E. Franer. New York, 1874.
*SELIGMAN, G. G. AND BRENDA Z.: The Kabâbish, a Sudan Arab Tribe. Harvard African Studies, vol. ii (1918), Cambridge, pp. 105-187.
*SELIGMAN, C. G.: Some Aspects of the Hamitic Problem in the Anglo-Egyptian Sudan. Jour. Roy. Anth. Inst., vol. xliii, (1913), pp. 593-705.
*SICK, EBERHARD VON: Die Waniaturu (Walimi),—ethnographische Skizze eines Bantu-Stammes. Baessler Archiv, Bd. v (1915), pp. 1-62.
SMITH, A. DONALDSON: Through Unknown African Countries. London, 1897.
*SMITH, EDWIN W., AND DALE, A. M.: The Ila-Speaking Peoples of Northern Rhodesia. 2 vol. London, 1920.
*SMITH, ELLIOTT: article Anthropology, Encycl. Britanica. 12th ed., vol. xxx, particularly pp. 147-155.
———, Migration of Early Culture. Manchester, 1915
———, Primitive Man. Proceedings British Academy, vol. VII.
SOLLAS, W. J.: Ancient Hunters, and their Modern Representatives. London, 1915.
*———, SOUTH AFRICAN NATIVE AFFAIRS COMMISSION, 1903-1905. Report with Annexures and Testimony. 5 vol. Cape Town, 1905.
*———, SOUTH AFRICAN NATIVE RACES COMMISSION: Natives of South Africa, their Social and Economic Condition. London, 1901.

SPEKE, JOHN M.: Journal of the Discovery of the Sources of the Nile. New York, 1864.

SPENCER, HERBERT: Descriptive Sociology .... vol. iv, African Races, compiled and abstracted by Prof. David Duncan.

STANLEY, HENRY M.: In Darkest Africa, or the quest, rescue and retreat of Enim, Governor of Equatoria. 2 vol. New York, 1890.

STANNUS, H. S.: Notes on some Tribes of British Central Africa. Jour. Roy. Anth. Inst., vol. xl (1910), pp. 285-335.

*———, The Wayao of Nyassaland. Harvard African Studies, vol. iii, Cambridge, 1922, pp. 229-373.

STIGAND, CAPT. C. H.: Notes on the Natives of Nyassaland, North East Rhodesia, and Portuguese Zambesia, their Arts, Customs and Modes of Subsistence. Jour. Roy. Anth. Inst., vol. xxxvii (1907), pp. 119-132.

STIRKE, D. W.: Barotseland. Eight Years among the Barotse. London, 1922.

*STOW, G. W.: Native Races of South Africa. Edited by G. McCall Theale. London, 1905.

*TANGYE, H. LINCOLN: In the Torrid Sudan. Boston, 1910.

*THEALE, GEORGE MCCALL: History and Ethnography of South Africa before 1795. vol. i. London, 1907.

*TORDAY, EMIL, AND JOYCE, T. A.: Notes Ethnographiques sur le peuples communement appelés Bakaba, aussi sur les peuples apparentés Les Bushongo. Tome ii, Fasc. i, des Documents ethnographiques concernant les polulations du Congo Belge. Bruxelles,

———, On the Ethnology of the South-west Congo Free State. Jour. Roy. Anth. Inst., vol. xxxvii (1907), pp. 133-157.

TREMAUX, P.: Le Soudan. deuxième ed. Paris, (?)

VAN DER BURGT, LE R. P. J. M. M.: Eléments d'une Monographie sur l'Urundi et les Warundi. Bois-le-Duc (Hollande) 1903.

*VAN OVERBERGH, CYR.: (avec la collaboration de Ed. de Jonghe) Les Bangala. N°. i, Collection de Monographies ethnographiques. Bruxelles, 1907.

WAKEFIELD, THOMAS. Footprints in East Africa. London, 1866.

*WEEKS, REV. JOHN H.: Anthropological Notes on the Bangala of the Upper Congo River. Jour. Roy. Anth. Inst., vol. xxxix (1909), pp. 97-136, 416-459, vol. xl (1910), pp. 360-427.

WEISS, MAX: Die Völkerstämme im Norden Deutsch-Ostafrikas. Berlin, 1910.

*WERNER, ALICE: The Galla of the East African Protectorate. African Soc. Jour., vol. xiii, pp. 121 ff., 262 ff.

*———, The Natives of British Central Africa. London, 1906.

*WESTERMANN, DIEDERICH: The Shilluk People,—their Language and Folklore. Philadelphia, 1912.

*WEULE, KARL: Native Life in East Africa: the Results of an Ethnological Research Expedition. Transl. by Alice Werner. New York, 1908.

*WHITE, MAJOR R. F.: Notes on the Turkana Tribe. Sudan Notes and Records, vol. iii (1920), pp. 217-222.

*WISSLER, CLARK: The American Indian. 2nd ed. New York, 1922.

———, Material Cultures of North American Indians. Amer. Anth., vol. xvi (n.s., 1914), pp. 447-505.

———, Psychological Aspects of the Culture-Environment Relation. Amer. Anth., vol. xiv (n.s., 1912), pp. 217 ff.

*———. The Influence of the Horse in the Development of Plains Culture. Amer. Anth., vol. xvi (n.s., 1914), pp. 1 ff.

———, Psychological and Historical Interpretations for Culture. Science, vol. xliii (n.s., 1916), pp. 193-201.

*———, General Discussion of Shamanistic and Dancing Societies. Anth. Papers, Amer. Museum of Natural History, vol. xi, part 12, 1916.

ANTHROPOLOGY AT THE COLUMBUS MEETING OF THE CENTRAL SECTION OF THE AMERICAN ANTHROPOLOGICAL ASSOCIATION

The Fifth Annual Meeting of the Central Section of the American Anthropological Association was convened in the Audience room of the Museum of the Ohio Archaeological and Historical Society, Columbus, Ohio, at 10:15 A. M. Friday, May 14, 1926. President Chas. E. Brown, Chief of the State Museum of Madison, Wisconsin, was in the chair.

A. C. Johnson, President of the Ohio Archaeological and Historical Society extended the welcome in a cordial, though brief, address. President Brown responded for the Section, following with his annual report. Three Committees were appointed by the President: an Auditing Committee with H. C. Shetrone of Columbus, Ohio, Chairman, and Dr. Geo. L. Collie of Beloit, Wisconsin and Dr. W. B. Hinsdale, Ann Arbor, Michigan as members; a Nominating Committee with Dr. W. C. Mills, Columbus, Ohio, Chairman, and P. E. Cox, Franklin, Tennessee and Dr. Ellsworth Faris, Chicago, Illinois, members; and a Committee on Resolutions with Dr. Fay-Cooper Cole, Chicago, Ill., Chairman and Dr. Chas. R. Keyes, Mt. Vernon, Iowa, Dr. J. E. Pearce, Austin, Texas, and Dr. Carl E. Guthe, Ann Arbor, Michigan, members.

The opening of the program for the morning consisted of five minute reports on "Anthropology and Archaeology in Institutions of Higher Learning." Dr. Fay-Cooper Cole spoke for the University of Chicago, Dr. Carl E. Guthe, for the University of Michigan, Dr. W. C. Mills for the Ohio State University, Dr. G. L. Collie for Beloit College, Dr. J. E. Pearce for the University of Texas, Chas. E. Brown for the University of Wisconsin, P. E. Cox for Tennessee, Miss Anna O. Shepard for the Nebraska State University, and Dr. E. Faris added information for the University of Chicago.

The reports brought out the diversity of the teaching of Anthropology in the various institutions. Some open classes for the undergraduate body; others only for graduate classes; still others with a chair in Anthropology have no classes but do only research work. The amount of credit given for work varies greatly. In one

institution until recently no credits were given for work in classes in Anthropology. The sizes of classes varied from 30 to as high as 500 students receiving such instruction. The concensus of the reports showed a greatly increased interest in Anthropology both among the students and the public at large, and more attention being given in all colleges with new courses being opened at present in several.

H. R. Goodwin of the Ohio State Museum spoke on the "Adaptation of the Hopewell-Culture Mound Designs to Present-Day Artistic Utilization." He said it was no new thing for designers of textiles to visit museums in the hope of finding among the collections, motifs for novel and original patterns. Having had experience in designing, on entering museum work at the Ohio State Museum, Mr. Goodwin was attracted by the art of the Mound Builder, from which he endeavored to produce designs adapted to use for carpets, rugs, draperies, pottery, etc. He made no attempt to trace the origin of the highly conventionalized forms found among the articles brought to light by the explorations of the Ohio Archaeological and Historical Society nor to suggest a possible symbolism but showed the possibilities of certain selected units from the art of these prehistoric peoples which, with harmonious color arrangement, produced attractive designs. In this, while the original motif is relegated to second place by the coloring, still the Mound-Builder motif is the base of the pattern. Mr. Goodwin exhibited a large number of colored designs which illustrated the breadth of form allowed, and the value of the units from the Mound-Builder art.

Dr. Carl E. Guthe, of the Museum of Anthropology, University of Michigan, at Ann Arbor, spoke on "Some Notes on Pottery Classification." He showed the great need at the present of a universally accepted basis for classification, one to be used by all workers. Dr. Guthe made this under five heads, which, with agreed definitions, would make more understandable all pottery, especially primitive and prehistoric. Under "Construction" he included: how made, whether on a wheel, by coiling, dabbing, or casting. Under "Paste": the color of the material, the nature of the material, and whether hard or soft. "Finish" should include: whether or not the ware was untouched after making, smoothed, polished, painted or decorated with slips. Under "Decoration" he included heads of Plain, Incised, Pressed, Painted, or Added Clay. Under fifth place, "Shape" is found the greatest need for definition as to: form, lip, neck, base, bottom, etc., the points to be used in making measurements.

Prof. J. E. Pearce of the University of Texas at Austin, exhibited a series of objects which he described in his paper, "Some Unique Stone Artifacts of Texas." Some forms are confined to the Texas area. He described finds in caves and rock-shelters. Dr. Pearce said pottery was not found in western Texas, and only in comminuted pieces in eastern Texas.

Noon luncheon was tendered the members at the Union Building on the Campus, through the courtesy of the Ohio State Archaeological and Historical Society.

The afternoon session was called to order at two o'clock by President Brown. P. E. Cox, State Archaeologist from Franklin, Tennessee, read a paper on the "Discovery of Primitive Man in the Caves of Tennessee." He described the caves, the magnitude of the inhabited areas and the fields adjacent used for primitive food production; and told of the grave finds near the caves as well as on the platforms before them. He assigned great antiquity to the culture of these cave people.

Dr. A. V. Kidder, Secretary of the American Anthropological Association, Andover, Massachusetts, spoke on "Basic Problems of New World Archaeology." He told of the culture being agricultural at the base, essentially "Corn Culture." He entered briefly into the problems of whence came the Amerind, when, and his place in the social scale on his arrival. He also told something of work being done in this field.

B. F. Greenman of the Museum of Zoology, University of Michigan, Ann Arbor, described his finds while excavating "Michigan Mounds with Special Reference to Two in Missaukee County." Apparently two cultural types were represented in the two mounds.

Geo. R. Fox, Director of the E. K. Warren Foundation, Three Oaks, Michigan, talked on "Shell-Mound Builders," with special reference to a cemetery he had excavated on Perico Island, Florida. He exhibited skulls and other bones. Attention was called to the enormous extent both as to country covered and the extent of the shellmounds themselves; and the problem of the time required for their formation was presented. The finds made in a sandmound by J. W. Fewkes on Weeden Island, Florida, were referred to in relation to the find on Perico Island, where the bones were found likewise in sand, but in the level island floor instead of a small dune. The Perico Island cemetery is of unknown extent. Two known plots have been excavated. In the one described, thirteen skulls

were found. No complete skeletons were unearthed; all bones were disarticulated, apparently before burial. Interment was in shells, a base of fulger shells having been laid down, then the bones placed at random and in all conceivable positions, and more fulger shells placed in and about the skulls and bones. Two femurs were shown with lesions presumably of syphilitic origin.

Dr. W. B. Hinsdale, Curator of Michigan Archaeology at the Museum of Zoology, University of Michigan, delivered an illustrated talk on "Navigating the Inland Waters of Michigan with the Indians." The waterways of Michigan were one of the Indians' principal highways in that state and Dr. Hinsdale showed, by means of many maps, how the Indians of early days found it possible to go entirely across the Lower Peninsula with but very short portages, sometimes without any. The old maps of the French regime and the early mays of the American occupation, had indicated these old water trails, and the main land trails followed by the redman through Michign.

Dr. Geo. L. Collie, of Beloit College, Beloit, Wisconsin for the past season has been conducting excavations in a cave in France. His paper on "Upper Magdalenian Culture as revealed by specimens taken from the Logan Museum site at Les Eyzies, France" gave the results of this work. He brought with him a large number of specimens which were exhibited and explained.

Dr. Chas. R. Keyes, State Archaeologist of Iowa, spoke on the "Iowa Pottery Complex." He pointed out the various types known in the state, where found and told of their relations to types found in other cultural areas. Dr. Keyes located the Hopewell type in eastern and southeastern Iowa. Slides were used to point his conclusions.

"Wisconsin Indian Harpoon Points" was the title of the paper presented by Chas. E. Brown, Chief of Museum, State Historical Society, Madison, Wisconsin. Specimens of the various implements of this class used in the state were displayed, ranging from bone through copper, to the trade harpoon of iron.

Through the courtesy of Pres. A. C. Johnson of the Ohio Archaeological and Historical Society the Section was entertained at supper.

The evening session was opened by a talk on the "Hopewell Culture," illustrated by slides. H. C. Shetrone, Curator of Ohio Archaeology, State Museum, Columbus, gave the address. The remarkable ability along artistic lines of these unknown peoples was

shown by examples of work found at the various sites of this culture excavated in the state.

A round-table discussion of archaeology and the state surveys was led by Dr. A. V. Kidder, who told what was being done along these lines, and of the National Research Council's desire to render assistance. On requests for suggestions Dr. C. R. Keyes favored personal visits of a representative of the committee to the backward states to advise and inspire.

The round table discussion of Anthropology was led by Dr. Fay-Cooper Cole who spoke on its needs and the work being undertaken along anthropological lines.

The Saturday morning meeting was called to order at 9:15 for the business session. Under a motion made by Dr. Keyes the reading of the minutes was dispensed with. The Secretary's report showed fifty-nine members at the time of the 1925 annual meeting. Since that time five active and two associate members have been dropped for non-payment of dues, one has died, and two active and one associate have resigned, a total loss of eleven. To the forty-eight still on the rolls eleven new active members have been added, three associate members joined, and ten transferred to the Central Section, a total of twenty-four, making the membership at the time of the meeting, seventy-two. On motion of Dr. Cole, seconded by Dr. Mills, the report was adopted.

The Treasurer's Report showed cash on deposit May 14, as $260.69 against which were checks outstanding of $108.02, leaving $142.67 in the Society's treasury.

Cash at the 1925 meeting, $121.60. Central Section's receipts since have been the dues of fifty members, $50.00, and a gift Dr. Otto L. Schmidt of Chicago, $25.00. Total receipts, $75.00. $196.60 is the total for 1925-26. The expenses of the section have been dues to the national association included in the 1925 report, $25.00, printing $19.50, telegram 90 cents, and stamps $8.62; a total of $54.02, leaving a balance of $142.58. The Auditing Committee reported that they had audited the accounts and found the report correct. On motion of Chairman Shetrone, the report was adopted.

P. E. Cox of Tennessee submitted a resolution which was adopted after some discussion.

"Be it resolved (1) that the Central Section of the American Anthropological Association appreciates the request of the National Research Council communicated by Dr. A. V. Kidder, soliciting suggestions.

(2) that the President appoint a Committee of three members of the American Anthropological Association to be called the National Research Council Committee.

(3) that upon application being made to the Central Section of the American Anthropological Association by any state or reputable scientific organization seeking the assistance of the National Research Council, the Secretary of the Central Section will refer such request to the chairman of this committee who will submit the same to the Committee and if the Committee approve, the Chairman will submit such request with full explanation to the National Research Council for action, requesting that the Chairman of this Committee be notified of the action of the National Research Council. The Chairman will then notify the applicant.

(4) that the American Anthropological Association (Central Section) keep in close touch with the National Research Council, and communicate any information received from the National Research Council to the members of the Central Section.

(5) that the Secretary of the Central Section give the press information of this resolution, requesting its publication."

The Central Section received invitations to hold its annual meeting for 1927 in two cities. Dr. E. Faris invited the Section to come to Chicago and P. E. Cox invited it to come to Nashville. On a rollcall, the Section selected Chicago as the place for the next meeting.

The report of the Nominating Committee was read. The nominations were President, Dr. Chas. R. Keyes; First Vice-President, Dr. Fay-Cooper Cole; Second Vice-President, Dr. G. L. Collie; Secretary and Treasurer, Geo. R. Fox. The five members who with officers make up the Executive Committee were nominated as Dr. Ellsworth Faris, H. C. Shetrone, C. E. Brown, Prof. J. S. Pearce, and Dr. Carl E. Guthe. No further nominations were received and on motion of Dr. Mills, seconded by P. E. Cox, the recommendations of the Nominating Committee were approved; under suspension of the rules, on a motion by Blackburn, seconded by Mills, they were declared regularly elected.

Dr. Fay-Cooper Cole, Chairman of the Resolutions Committee, reported two resolutions:

"Resolved that we desire to express to the Ohio State Archaeological and Historical Society our hearty appreciation of the fine arrangements made for our reception in the classic center of Ameri-

can archaeology, and for the generous hospitality shown both in connection with the program carried out in the Society's great Columbus Museum, and in connection with the field trip to Fort Ancient, the Serpent Mound, and other major Ohio antiquities. We shall remember with especial pleasure the fine contributions of President Arthur C. Johnson, Director Wm. C. Mills, and Curator H. C. Shetrone."

"Resolved that in the death of Mr. Alanson Skinner the American Anthropological Association, Central Section, has lost an honored friend and an able investigator. His great enthusiasm and wide experience made his work of unusual value, and we feel that science has suffered an irreparable loss in his untimely death."

Dr. Ellsworth Faris, of the University of Chicago, had the first paper of the Morning, "A Restatement of the Problem of Diffusion vs. Independent Origin." Dr. Faris deplored the two schools which have arisen around this problem of Anthropology. He contended that the adoption of one or the other of the schools by scientific investigators had produced controversy, and wasted effort. He suggested that inasmuch as the problem of diffusion is the problem of connecting, wherever possible, similar products of human culture, the isolated cases of independent origin be ignored. He drew the distinction between technique and culture, the former diffusing promptly, the latter, because emotional and often-times religious, being more resistant to attack, much more slowly. The study of diffusion, an undeniable phenomenon, promises rich results. Independent origin, which may occur, promises nothing fruitful in a study of its examples. A study of the small number of so-called instances of independent origin, leave the student with a collection of curiosities and no more knowledge about human nature than when he began, for if the elements are really the same it is hardly possible to be dogmatically sure that they are not connected.

Dr. Fay-Cooper Cole, in "Contribution of Anthropology to the Study of the Alien Problem," showed that until the mind of the immigrant, his customs, and his habits were studied and an approach to an understanding of his psychology achieved, no real solution to the alien problem could be suggested.

Miss Ruth Shonle of Chicago University read her paper on "Suicide among Preliterate People." She showed that in nearly all cultural states, suicide occurs, mentioning the Australian, the Negrito and the Bushman as apparently being exempt. She classified

suicides among the preliterates as of two main classes, that in which personal reasons, as fear, love, hate, despondency, and the like induce self-destruction; and the institutional or that in which the group psychology determines suicide, either by direct decision or in response to custom, as, for example, the suttee.

In "An Anthropological Approach to the Study of Human Dentition," Wilton M. Krogman of the University of Chicago said that the problem of the occulsion or contact of the teeth and its relation to malnutrition (or nutrition) is one that is confronting the dental world. Students have definitely proved that where babies have been fed artificially, i. e., bottle-fed, there is a definite trend toward malocculsion of the teeth. Mr. Krogman undertook to study the dentition of a series of 317 Melanesian skulls, representing individuals who had been naturally fed—breast fed—in infancy. The result demonstrated that breast-feeding plays an important part in the development of the teeth, for whereas in the case of bottle-feeding 80% of the individuals thus fed had malocclusion, in the cases of breast-feeding 79.6% had normal occlusion. The situation is thus exactly reversed.

After a luncheon given by the Ohio Archaeological and Historical Society, the Central Section members to the number of fifty, started in automobiles for Fort Ancient. The old fort was reached about three o'clock. After an inspection of various parts of the site, Warren K. Moorehead, who made extensive explorations many years ago, gave a short talk on its antiquity.

The night was spent in Winchester. Next morning with an early start the members of the Section reached the Serpent Mound Park an hour before noon. The sinuous curves of the great mound were viewed and much speculation indulged in. Dr. A. V. Kidder was called upon to tell something of the mound, but contented himself with discussing the agricultural basis of the prehistoric culture of America. He told of the indebtedness of mankind to the skill of the aboriginal man in America in domesticating such a large number of valuable food and other plants, without which civilization now would find it difficult to exist.

A picnic lunch was served by the ladies of the party, and the trip was resumed toward the Seip Mound. The work at this mound, about one-third done, was explained by H. C. Shetrone under whose direction it was undertaken. A visit to Mound City Park just north of Chillicothe disclosed the plans of the Ohio Archaeological Society

for its restoration. The work already is well under way. On the way back to Columbus the Logan Elm was visited.

Such spare time as the members could secure between sessions, in Columbus, was spent by practicallly all, in studying the very fine collection of articles in the Museum; the artifacts were obtained from the exploratory work the Ohio Archaeological and Historical Society. Dr. Mills, Curator Shetrone, and Registrar Goodwin devoted a large portion of their time to explaining the collections.

GEORGE R. FOX,
Secretary

ANTHROPOLOGICAL SOCIETY OF WASHINGTON

At the 591st meeting of the Society, held on October 20, 1925 in the new National Museum, Dr. John M. Cooper read a paper on "The Têtes de Boule of the Upper St. Maurice," basing his remarks on two visits to them, one in 1916 and the other in June of this year.

They are a hunting and trapping people who occupy most of the water-shed of the St. Maurice River in Quebec, the northern band straddling at points the Hudson Bay divide. Some of the anthropometrical averages obtained for adult men were: stature, 168.6; cephalic index, 80.67; face breadth, 147.4. The linguistic material gathered seems to show quite clearly that the language spoken is a Cree dialect. The Têtes de Boule thus appear as the easternmost Cree. The chief phonetic change is Tête de Boule *r* for common Cree *y*, The northern band of the Têtes de Boule call themselves Obidjiwan iriniwàk, "men of Obidjiwan."

They have the typical northeastern family hunting grounds, with inheritance usually in the male line and with use of selection and rotation for conserving the game supply. Marriage is usually patrilocal. Women are well treated. No trace of sib organization or of totemic tendencies was found. The chief has very limited power. There are two assistant chiefs. The chieftaincy is not necessarily hereditary, but actually tends to pass from father to son. Among the adolescent boys and girls, chums are common, but no indication of the gang appeared. Baskets are decorated with spruce root, but the double-curve motive, quill and moose hair ornamentation, and bark etching are absent. Psychically the Têtes de Boule are characterized by evenness of temper, good humor, truthfulness, and honesty, and socially by marked peacefulness and democratic spirit. The social atmosphere and organization is distinctly non-competitive, even competitive play being seemingly absent.

The 592nd meeting of the Society was held on November 17, 1925, at the United States National Museum. Dr. Aleš Hrdlička addressed a crowded hall on "Ancient Man in the Far East." He had just returned from a round-the-world trip made to study at first hand some of the crucial evidence on primitive man of the past and

present. He dealt more particularly with the Rhodesian skull. As a result of his research and observation at the Broken Hill mine, he has been able to clear up many of the uncertainties that have surrounded the discovery of this remarkable specimen.

It was found by a miner near the lower end of an old bone- and detritus-filled cave that sloped down from the former surface. The upper part of the cave was largely filled with a great quantity of animal bones, among them a few human remains, and some stone artifacts. The long bones, including the human ones, had been broken or split to extract the marrow. Beyond this part of the cave was a stratum, thirty feet thick, of laminated soft lead ore, separating the anterior from the lower posterior section of the cave. The skull of Rhodesian man was found in the lower section, at a depth of 60 feet from the surface. It was not associated with other bones, but not far from it was found a human tibia and a fossil skull of a lion. The bones brought with the skull to England, aside from the tibia, may not belong to the lower part of the cave. These remains are from both male and female skeletons, show varying alteration, and clearly do not belong with the skull. The skull itself was found resting upright and intact, without the lower jaw, in a pocket of detritus and "bat" bones, as if put there intentionally. It showed originally no scratches or damage. Below it was found what looked to the discoverers like a roll of mineralized thick hide, and still lower and at some distance the human tibia and lion's skull. The last has apparently disappeared since the discovery. The roll may have been laminated lead ore. It was smelted, as was the mass of mineralized bones from the outer part of the cave.

How the skull came to be in such a place at the base of the cave, and who may have put it there, are questions which may never be answered. Nor is it possible at present definitely to classify Rhodesian man among any of the human races of the past or present. The find will probably remain a great anthropological enigma until further evidence bearing on this form of man be discovered.

At the 593rd meeting of the Society held on December 15, 1925, Mr. W. H. Jackson, photographer (1870-79) to the Hayden Geological Surveys, related his experiences "With the Pawnee Indians 50 Years Ago," his address being illustrated with slides from his negatives made in 1868-71.

Mr. Jackson crossed the plains to California in 1866, the last year of overland travel by wagon train. Returning eastward as

far as Omaha, he went into the business of photography and began making pictures of the Indians, frequent visitors to the city, and of their outlying villages, with occasional trips to make views along the completed portions of the Union Pacific Railroad.

The Pawnee Reservation, where most of the pictures were made, was on the Loup Fork of the Platte River, about 100 miles west from Omaha. The two principal villages, composed entirely of earthen lodges, 30 to 60 feet in diameter, at the eastern end of the reservation, were the ones most frequently visited. Lieut. Long, who had passed that way 50 years previously, had estimated the Pawnee there to number 10,000 or more, but disease and constant warfare with their neighbors, the Sioux, had reduced them to less than one fourth of this number. Further agressions, intensified because of the enlistment of many Pawnees into the Army to assist in protecting overland travel, led finally to their removal to the Indian Territory and the entire abandonment of their villages by 1875.

Besides detailed views of the villages, typical portraits, and the Industrial School with groups of children "before and after," illustrations were shown in conclusion of the laborious and complicated "wet plate" process for making photographs "50 years ago."

At the 596th meeting of the Anthropological Society on March 16th, Mr. W. H. Jackson, photographer to the Hayden Geological Surveys, 1870-79, reviewed his experiences of fifty years ago among cliff ruins and Pueblo villages in Colorado and New Mexico, illustrating his subject with slides from original photographs. While engaged in photographing among the San Juan Mts., in 1874, a chance meeting with prospectors, who told of some wonderful cliff dwellings not far from their camp on the Rio La Plata, led to the discovery, or more properly, the first published account, of the Mesa Verde ruins. (Letter to the New York Tribune, Nov. 3rd by Ernest Ingersoll.) Following their advice that something worth while might be found in that region, Mr. Jackson left his main party in camp at Baker's Park and with Mr. Ingersoll, and two packers, made a hasty side trip to the miners camp where he met John Moss, who had traveled extensively over the Southwest and who volunteered to guide the party through Mancos Canyon in the Mesa Verde, where he said the best examples of ancient cliff dwellings were to be found. On a six day ride taking in the Mesa Verde, the McElmo canyon and the Hovenweep valley, many of these ruins were discovered and photographed, but missed the greatest and most in-

teresting group of all, now the main feature of the Mesa Verde National Park, which was not discovered until fourteen years later. The results of this first expedition among the cliff dwellings were of such interest that exploration was continued the following year into Utah and Arizona. Mr. W. H. Holmes also led a party into this region, and while primarily engaged in geological work, yet devoted much time to archaeological research, paying particular attention to the towers of the San Juan Valley. Mr. Jackson's party followed the San Juan river to the Chinle, and thence to the Hopi pueblos. Returning northwards they visited the Abajo and La Sal Mountain region and then followed the Montezuma Canyon back to the starting point. Many interesting cliff, cave and town ruins were discovered and photographed, nearly every canyon, mesa or valley throughout the whole region containing evidences of prehistoric occupation. The Southern Utes, as well as the irresponsible renegades farther west, were troublesome this year, Mr. Gardner's topographical party being attacked near the Abajo Peaks by a large party, with the loss of three animals killed and all his camp equipment. Mr. Holmes' party came near loosing all its animals, and Mr. Jackson also had frequent encounters, but without loss. In 1877 an extended trip was made through New Mexico to the Hopi pueblos in Arizona, during which Mr. Jackson made a detailed study of the Chaco Canyon ruins, and with the reports which followed, concluded his archaeological work for the Survey.

The 597th meeting of the Society was held in the United States National Museum on April 20, 1926. The program consisted of an address on "Fifty Years of Pueblo Archaeology" by Dr. Walter Hough. Exploration during the past fifty years in the Pueblo region forms an interesting history. Veterans of the discovery of the cliff-dwellings in 1874-75 are still with us, W. H. Jackson, who discovered and photographed, and W. H. Holmes, who sketched and pictured in oils the first cliff-dwellings. As this work on the Southwest archaeology was carried on by the U. S. Geological Survey and the Bureau of American Ethnology almost exclusively until recent years, it is observed that more than half of the investigators were members of the Anthropological Society of Washington.

In the period of reconnoissance beginning in 1869 the names of Holmes, Jackson, Yarrow, Powell, Stevenson, Bandelier, and Cushing stand out prominently. Beginning in 1879 work in all the branches of anthropology was actively prosecuted by the Bureau

of Ethnology. In 1886 the Mindeleffs studied the architecture of the ancient and modern pueblos over a wide region, furnishing invaluable data. Exploration in the sense of excavation of ruins began in the 80's. Cushing carried on exploration work on a large scale in the lower Salt River Valley and also collected archaeologica at Zuñi. Historically, the first ruin explored was at St. George, Utah, in 1869-70 by Edward Palmer, a most indefatigable collector. The St. George specimens are in the National Museum and the Peabody Museum at Cambridge, Mass. In 1894 Nordenskijöld published the results of his exploration of Mesa Verde cliff-dwellings. This work is a landmark. In the 90's Dr. J. Walter Fewkes entered the field, exploring a ruin called Skyatki on the Hopi Reservation. Dr. Fewkes continued his researches for many years and is still active. In this period came Hough, Hodge, Hewett, Moorehead, Dorsey, Owens, Pepper, Hrdlička, Prudden, and others.

The period of more intensive exploration presents the names of Kidder, Nelson, Morris, Judd, Cummings, Spier, Guernsey, Jeancon, sent out by different institutions. In this period methods depending on a classification of sherds, the presence or absence of pottery, stratification and superposition have cast much light on the history of the ancient peoples of the Southwest. We have here a good example of the normal development of research in the past 50 years. The order of culture in the ancient pueblos are now tentatively Basket Maker, Post-Basket Maker, Pre-Pueblo, Pueblo, and Recent. Much is to be expected of the active and enthusiastic workers of the present in clearing up the problems of Pueblo archaeology, and the best wishes of the Old Guard go with them.

The modern phase of pueblo exploration which was formerly impracticable in the vast field to be covered is seen in the National Geographic Society's work at Pueblo Bonito under the direction of Neil M. Judd, and Dr. A. V. Kidder's work for Phillips Academy, Andover, Mass., at Pecos. It is seen that great financial resources are necessary to uncover and throughly explore one relatively large ruin. This, however, is the only way to elicit the further story of ancient Pueblo Indian life.

JOHN M. COOPER,
Secretary

ARCHAEOLOGICAL WORK BY STATE AGENCIES IN 1925.

Alabama. Archaeological work conducted in Alabama during the current year has been practically altogether confined to some individual research by members of the Alabama Anthropological Society and the staff of the Department of Archives and History.

The one or two casual finds of urn-burials as far north as the old Alibamo town of Taskigi at the confluence of the Coosa and Tallapoosa, 12 miles north of Montgomery and near the center of the State, have been added to and it is now considered that this practise was general at that point. The location at the same time, indicates either the long habitation of several different peoples or that different practises were in use. Archaeological evidences indicate a predominance of Creek Indian suggestions though there are many recent excavations which show that the contact with Europeans had not at the time of death existed. During the year some interesting bobbin-shaped ear plugs and bear tooth ornaments were taken out. Adolescents in urns were often found in direct contact with interments at length and burials in flexed positions.

The river at this point is encroaching on the old site of the town and as the burials are here between the mound and the river, as well as east of the mound toward the rising sun, many of those on the Coosa River side are now getting into the stream. These rarely indicate European contact. In fact, only casual indications of trade objects are seen here and these may have been those of later days when the French Fort Toulouse was adjacent.

Reports have been received by the Department of Archives and History of finds at Clayton in the southeastern section of the State and a collection of pots indicating Creek manufacture was presented from the old village of Watoola in Western Russell County. This latter find is interesting in that this site is referred to in the Creek migration legend as the site of Watoola-Hoka-Hatche, or Whooping Crane Creek. *Peter A. Brannon.*

Colorado. The annual archaeological expedition of the State Historical and Natural History Society of Colorado was in the field two months during the year 1925. The expedition had for its purpose the studying of two problems: the first one being that of an intensive examination of a circular dance plaza and the second

the excavation and study of a large mound whose surface features indicated a large circular building of river boulders.

The dance plaza problem was taken up and brought to a successful termination during the month of July. As a result of the work we now have a very good idea of a typical site of such a character. The first occupation occured during the Post-Basket Maker period with well defined house and other remains. At a later period the site was reoccupied by the Pre-Pueblo people who used the central dance plaza but filled in the house sites on the outer periphery and erected dwellings of cobble stones upon the fill.

The whole site was covered with a dense growth of sage brush which is of very recent origin. The humus covering the entire surface of the site varied in depth from 3 to 6 inches.

The second problem was brought to a successful termination by the last of August and gave very interesting results. The mound, varying from 8 to 16 feet in height was built on the sloping shoulder of a mesa overlooking the Piedra river. Many of the boulders were of such size as to make it necessary to have two men handle them and it must have involved a tremendous amount of labor to have carried them from the river where originally found to the mesa top. No boulders even approximating them in size occur anywhere on the mesa tops.

The circular, tower-like structure was enclosed in a rectangular, solid mass of boulders. That it was used as a dwelling and not as a ceremonial house is indicated by the finding of two mealing bins on the floor, with the sides and bottom intact and with the manos still in place on the little shelves made for them on the sides of the bins. What little pottery was found was definitely of Pre-Pueblo type.

In addition to the two problems studied, a few days were spent in pot-hunting on the Stollsteimer Mesa, three miles below the above named places. Some very good specimens of pottery of the Pre-Pueblo period were found, as well as several skeletons of which only one was in condition to exhume.

After finishing the work on the Piedra river a week was taken to explore, photograph and measure certain ruins near the Colorado-Utah border. Here were found several amazingly large pueblos; some of them still having standing walls that rose to the height of thirty to forty feet, built of beautifully dressed sandstone. Judg-

ing from the surface indications the latest of these buildings belong to the "Golden Age" of the prehistoric pueblos.

There are many indications of earlier buildings and potsherds which indicate that some of these would go back into the early Pre-Pueblo or even the Post-Basket Maker period. The typical circular dance plaza of the latter period is very much in evidence.

J. A. Jeancon.

Indiana. In connection with the study of geological conditions in Harrison County, the State Geologist and a field party under his direction located a number of flint quarries, camp sites, stone shelters, mounds and burial places. A map will be prepared showing the location of these deposits. Reported discoveries in other parts of the State were examined.

During the field season representatives from the Indiana Historical Bureau and of the Division of Geology of the Indiana Conservation Department made an attempt to secure funds for the scientific investigation of some of the mounds in Indiana. The amount promised was not deemed sufficient for the purpose, and the exploration is delayed for the present.

The Committee on Archaeology of the Indiana Academy of Science called attention to the desirability of a law which would prevent the spoilation of archaeological mounds in Indiana, and invited the attention of the Committee on Legislation to the matter.

W. N. Logan.

Michigan. Mr. Emerson F. Greenman and the writer have confined their work to the archaeology of the state. Mr. Greenman spent four months in the field digging, chiefly in Missaukee county. He investigated two circular inclosures about 200 feet in diameter. He tentatively advances the theory that they were winter encampments of some, yet unidentified, group of Algonkian Indians. Two mounds were excavated within a mile of the inclosures. The nearest one contained the skeleton of an aged male with no accompanying artifacts, and the other mound a partially cremated body, evidently that of a mature person, buried with the latter was a copper axe enclosed in a layer of bark, probably a ceremonial piece.

The writer traveled over three thousand miles. in quest of information, in localities where Indian occupation appeared to have been somewhat permanent as evidenced by old "works" of one kind and another, the most of which have been ruined for systematic investigation.

A week was spent, accompanied by a gentleman who was formerly State Geologist, in looking over some of the old mine pits upon Keweenaw peninsula. No rock fissure was recorded as a place where Indians secured copper unless, at least several, stone implements, whole or in pieces, were found. An interesting specimen of extensive rock carving was charted and modeled in Tuscola country. Particular attention was given to tracing the waterways followed by the primitive inhabitants of the state. No doubt, in a country of thousands of lakes and connecting streams, there was more travel by water than by over-land trail. We have, with accuracy, traced numerous long trails traversing the state in various connections. There were not less than five water routes across the lower half of the Lower Peninsula from Lake Erie to Lake Michigan, with but two to five miles of portage. In high water, some of these portages could have been made entirely by canoe. The winter is being spent in charting the state by sections and in making maps showing travel and transportation routes and in revising records.

A small volume has been issued by the Museum upon "Primitive Man in Michigan" which it is hoped will serve as a kind of introduction to the larger work still to be accomplished.

The University has a fund, approximating a million dollars, for a new museum, work upon which will commence in 1926. This structure will provide amply, for considerable time to come, for the ethnological, and archaeological material and furnish offices and work rooms for the various departments in anthropology.

W. B. Hinsdale.

New Mexico. The Museum of New Mexico accomplished its third season of excavation, under the direction of Wesley Bradfield, at the Cameron Creek site in the Mimbres region. The results of the three season's work will be published in a full report during 1926, if possible, to release the information obtained and serve as a starting point for further investigation.

During the year, a reconnaissance of the archaeological sites in the State has been started by making a library of sherd collections containing all the variations of pottery found on each site. These are catalogued as they are received; notes made of the individual sites, with references; sherds analysed as to character, etc. At the present time, this library includes over 165 sites. The information thus obtained will be open to inspection and study at any time.

The cooperation of all archaeologists working in the State is asked that we may make the sherd library as complete as possible.

Two weeks excavation was carried on at Gran Quivira under the direction of Dr. E. L. Hewett, and several weeks additional work done in clearing away the debris from the old mission church and convent at the same site, by Mr. Hudelson, preparatory to carrying out plans for partial repair and restoration of the mission church buildings. *Wesley Bradfield.*

Ohio. During the year we completed the Great Hopewell Group, which practically occupied the work of three seasons, and we are now satisfied that all of the mounds comprising the group have been carefully examined. The report upon this group has been prepared and will appear in our next quarterly, January, 1926, and many new objects were found in the Hopewell Group, especially designs cut in Mica as well as Copper. However, the Survey examining the mounds under the direction of Professor Moorehead found many designs in Copper but we were very fortunate in finding the designs in Mica.

A number of new features in burials were discovered, such as Copper nose-pieces; these were found for the first time in our Ohio mounds but later in the season we were able to find the same use of the Copper nose-pieces in Mound No. 2 of the Seip Group. Another interesting development was the finding of a great cache of forty or more celts, ranging in length from two inches to fifteen inches. In the same mound was found a fine example of the Grooved Axe, one of the best now in our Museum.

The final work on the Hopewell Group was completed the last of July. On the first of August the Survey moved to the Seip Group near Bainbridge, Ross County, Ohio, and began work upon the large Mound No. 2 of the Seip Group. This mound is 250 feet long, 150 feet wide and 30 feet high. Practically one-fourth of the mound was completely examined before the season closed—October 1st, and many very interesting problems were brought to light.

A large sarcophagus, made of logs, was found not far from the west end of the mound. This sarcophagus contained four adults and two children. The adults had been wrapt in a burial robe, which was covered with designs beautifully colored in red, yellow and black, and these colors were practically preserved by large copper plates which were placed beneath the bodies. This is the first

we have found of colored cloth in our Ohio mounds. The burials were also profusely covered with pearls made into the form of beads and for the most part attached to the colored cloth. Directly above the grave were found 5 large pipes—the largest one weighing 7¼ pounds. These pipes were made in the form of effigies of the dog, owl, bear and night-hawk, and were purely Southern in type. The Survey is looking forward to 1926 with much interest. *Wm C. Mills.*

Oklahoma. Our work began in the latter part of May, 1925, in Delaware County, Oklahoma, which is in the northeastern part of the state and which borders on both Arkansas and Missouri. In its area is embraced a part of the western extremity of the Ozark Uplift. It is rich in prehistoric remains since there are numerous caves, caverns and overhanging shelter ledges in the Boone Chert formation which were used as habitations by the Stone Age man. Mounds of the true Mound Builder type are to be found along several of the valleys and the smaller tumuli (domiciliary) of the comparatively recent Caddoan era are fairly common in certain localities. Thus far, we have not found any chert quarries within the limits of Delaware County, though there are some very extensive quarries of this class in the neighboring county to the north (Ottawa), which were examined and explored by Dr. William H. Holmes, of the Bureau of American Ethnology, more than twenty-five years ago.

The particular objects selected for excavation and examination during the season to be spent in that locality were (1) a cave, situated about three miles west and slightly south of the town of Grove, and (2) a mound located five miles north of the same place. My principal assistants were Mr. Otto F. Spring, whose boyhood and early youth had been spent in the community in which this work was to be done, had been educated in the University of Oklahoma, where his major course was in geology, and Mr. Harry C. Robertson, of Blackwell, Oklahoma, who had just received his bachelor's degree from Phillips University, at Enid. As a boy not yet through with his high school course, Mr. Spring had worked with me in the summer of 1916. Mr. Robertson had done considerable work on his own account in his home county, with some advisory assistance from me. We had a number of voluntary helpers, nearly all of whom were college and university students. We also employed the services of several laborers who were secured locally.

With a small group of student helpers, I had worked out the mouth of the same cave, in the summer of 1916, when the interior

was also partially explored. At that time, I succeeded in gaining access to a rather large chamber, situated at a distance of about 300 feet from the mouth of the cave but a very circuitous passage though but a fraction of that distance in a direct line. This interior chamber had evidently been inhabited but the original entrance had been sealed up and all surface traces thereof had disappeared. In arranging for the resumption of work in this cave, in 1925, it was my hope to be able to locate and reopen the former entrance. Unfortunately, the remote and rather tortuous passage, through which I had gained entrance to this chamber in 1916, proved to have been entirely filled with a drift of clay during the intervening period. An effort was therefore made to drive a tunnel through to this chamber by a direct course from the mouth of the cave, the distance between the two being estimated at from forty to fifty feet, with the material to be excavated consisting of a mixture of broken stones and heavy clay. Because of the excessive moisture due to a low temperature in the cave and the consequent condensation of water from the humid air currents passing through from the exterior, the work had to be discontinued until a cooler season and it has not since been resumed.

Another chamber of large floor area, but with a very low roof, was explored and found to be much more readily accessible. Its floor contents were removed and carefully sifted, resulting in the finding of good collection of specimens of Stone Age arts and crafts. The roof and floor of this chamber were so close together as to suggest that, unless the former had settled, this part of the cave could scarcely have been used for domiciliary purposes. It therefore seemed possible that the implements, weapons and utensils found therein might have drifted thither, especially as the floor seemed to slope downward in a direction toward the side of the chamber which was farthest from the edge of the bluff. Then, when further excavation revealed the fact that the edge of the chamber next to and paralleling the face of the bluff ended in a fault or perpendicular slide it became apparent that the chamber itself had once been a backward extension of a much more roomy rock shelter, the front of which might be found to have collapsed as the result of some sort of a cataclysm. Accordingly, we started a cutting from the face of the hill or bluff in front of this chamber, back to the outer edge of the same. This resulted in finding abundant evidence to the effect that there had been just such a collapse of the roof of a rock shelter

which had been inhabited, its floor now being buried beneath a deposit of from six to fifteen feet of rock and drift material from further up the slope.

The specimens secured from this cave, implements and weapons of chert and other forms of silicious rock, polished stone ornaments, bone implements and ornaments, beads fashioned from shell, bone, ivory and from teeth of animals, earthenware pottery (in fragmentary condition), bones and teeth of many game animals, bones of game birds, bivalve shells of many species, and bones and teeth of human beings, some of the human bones being in such fragmentary or charred conditions as to be suggestive of cannibalism. Nearly all of the bones of game animals had been cracked or broken for the evident purpose of extracting the marrow.

In cutting the passage from the main corridor of the cave into the low chamber a few feet to one side, it became necessary to remove, by blasting with small charges of dynamite, a large rock, sixteen inches thick and having about thirty-six cubic feet of material. It was evident that this rock had been embedded in the floor of the chamber for ages, yet, when it was removed, the clay underneath was found to contain fragments of bone which had been artificially broken, thus indicating that there had been an era of occupancy much more ancient than that which we were then investigating.

The mound, mentioned in the beginning of this report, was located in the valley of the Elk, or Cowskin River, within a mile of the confluence of that stream with the Grand, or Neosho River. It had been cone-shaped, originally, with an altitude of fourteen feet and a basic diameter of thirty-three feet. It had been constructed of light-colored clay, in which water-worn pebbles were of frequent occurrence, and, when completed, had been covered with a layer of black loam soil about eight inches thick. It was surrounded by a dense forest growth and trees of varying sizes were found growing on its surface.

Unfortunately, several years before our work began, this mound had been invaded and torn open at the top by vandals, at the instance of a commercial collector. Following the discovery of this trespass, the owner of the property hired inexperienced and unskilled help and continued the operations for a time. Naturally, the work was more or less clumsily performed and many artifacts were destroyed or lost. Moreover, there was no attempt made to keep any notes or records of the work and its results. Most of the collection—and

the best of it—was sent by the owner to an eastern museum. In consequence of all this, we were privileged to excavate only a little more than one third of the bulk of the mound. As previously stated, the mass of the mound was composed of a light-colored, compact clay. This, with the steep slope of the surface, resulted in an absence of visible moisture throughout the greater part of the mass and its dissection was difficult and tedious in consequence.

That this mound had been built ceremonially was quite evident. On the ground level, and approximately at the center of the base, there was found a group of three small ceremonial stone pipes. From the design of these, I was led to the belief that they were of proto-Siouan origin. If so, the construction of this mound must have antedated the settlement of the Siouan peoples on the Atlantic Coast. If such be the case, this should serve as a clue to the prehistoric migrations of at least one important linguistic stock. It did not appear that the mound had been designed for purposes of sepulture. Scattered throughout its bulk were many specimens of earthenware pottery, mostly broken, together with copper implements and ornaments, all seemingly deposited as votive offerings. The earthenware consisted principally of bowls and water bottles, nearly all of which were well made and gave convincing evidence of an artistic taste and skill of a high order. A number of pairs of pulley-shaped, deeply grooved stone ear ornaments were also among the items found. Most of these had had the obverse face or flange encased in a thin sheet of copper which fit perfectly, whether the surface be plain and smooth or ornamented with etchings or relief carvings, were found, as also several thin, flame-shaped or serpentine copper ornaments which might have been used in decorating a shield or a headdress. Among the copper implements were small, double pointed spindles and a tube that might have been used as a blowpipe.

If the mound had not been originally designed for the interment of the dead, it certainly had been diverted to such use in a more recent period. Scattered over its sloping surface were the evidences of not less than fifty shallow, intrusive burials. With several of these were found typical specimens of the modern Siouan ceremonial pipes, thus indicating the presence of people of some one of the tribes which compose the southern division of the Siouan stock—probably Osage. It would therefore seem not unlikely that these intrusive surface burials had been made within the past two centuries.

Although we were not privileged to work out the whole mound,

which would have been highly desirable, we secured a valuable collection of artifacts and, with it, a goodly stock of pertinent information which may prove to be equally valuable in comparison with the results attained in the excavation of similar earthworks elsewhere. There are numerous other tumuli of the true Mound Builder type in Oklahoma but whether all of these were of the same cultural origin remains to be determined.

After finishing the work undertaken on the mound and in the cave, the scene of operations was changed to a rock shelter, distant about three miles in a northwesterly direction from the cave. Several weeks were spent in excavating ash deposits at this site. The resulting finds seemed to indicate the remains of two, and possibly three, cultural eras, one being the same as that of the cave and the other still more ancient. The expediency of doing more extended work in other caves and underneath other rock shelters of that region in order to make possible the further study and the more complete identification of these several cultures is apparent.

Available funds for the continuance of the fieldwork having been exhausted, the work had to be discontinued for a time. After an interval of a few weeks, limited funds were secured from private subscriptions, whereupon the work was resumed, the scene of operations being shifted to Boone County, Arkansas, where the contents of two caves were excavated and thoroughly searched. One of these, located near the village of Everton and commonly known as the Brewer cave, proved to be of a culture distinct from that of the cave on the bank of Honey Creek resembling if not being identical with that of the rock shelter in Delaware County, Oklahoma, while the other, locally known as the Saltpetre cave, distant about six or seven miles from Everton was apparently of the same culture, yet with such marked distinctions as to suggest pronounced variation in habits. The contents of another large cave, distant about twenty miles from Everton, were examined and seemed to be of a culture entirely distinct from either of the others. As the result of our work in the caves and rock shelters, limited though it may seem to have been, we have been impressed with the importance of a concerted effort on the part of several competent investigators in the way of a proper differentiation and adequate identification of the several cave cultures of that region.

In conclusion, I wish to state that, as the result of recently secured subscriptions from private sources, we have resumed work, with

the scene of operations again shifted, this time to Kay County, on the Arkansas River, near the Kansas boundary, where several chert quarries and village sites—the latter of Caddoan origin and dating back not much if any more than two centuries—are to be worked. Later on, some time during the summer season, we want to undertake the dissection of a rather large mound which is in reality the ruin of a considerable pueblo, once inhabited by a stock of people who tried to practice agriculture by means of irrigation in northwestern Oklahoma and southwestern Kansas, some centuries since.

Joseph B. Thoburn

Pennsylvania. The "Indian Survey" of the Wyoming Historical and Geological Society of Wilkes-Barre began in March, and, made possible by the interest of a member of the Society, was undertaken because the story of the Indian culture of Pennsylvania has never been written, although other states with a less important Indian occupation, have investigated the evidences within their boundaries; and because the rapid disappearance of the evidences of the life of the Pennysylvania Indians through the encroachment of modern developments, makes it vitally desirable to gather all possible information before it is too late. The survey has been carried on under the direction of Arthur C. Parker, formerly N. Y. State Archaeologist, now Director of the Rochester Museum.

The effort to locate as many known sites as possible resolved itself into an "exploring expedition on paper." Approximately 13,000 letters were sent to the 2100 postmasters in the territory covered, Historical and Patriotic Societies, Farm Bureau and Grange leaders, foresters, school teachers, Scout masters, and many hundred known individual collectors in the forty-one counties comprising the Eastern portion of the State—west of the Alleghanies the tribal culture and relations were entirely different. Posters for distribution and question blanks to be filled out were enclosed in the letters. The newspapers throughout the region co-operated generously and published articles sent them explaining the survey, asking all individuals who had found Indian artifacts to communicate with the Society.

The subject of the Indian is apparently more popular with the average citizen than is commonly supposed. The Society did not wait long for the response. The postman was swamped with replies, varying in interest and importance from "Don't know nothing about these goods," to the invaluable information turned in by amateur

collectors and well-known historians. Photographs of rocks covered with Indian picture-writing, soon to be covered by one of the super-power dams, have been received. Old trails soon to be obliterated by railroad cuts and fills have been brought to the Society's attention. Persons having knowledge of special regions have recorded on maps furnished them for the purpose, burial grounds, village and camp sites, caches, etc. All the information has been arranged by county and is being catalogued; the names of the many persons offering further help being listed separately, for future reference.

The effectiveness of the survey is evident in that more than 1900 sites have been reported. *Dorrance Reynolds.*

Tennessee. Three trips were made for the purpose of visiting and reporting on that section of the country tributary to the Tennessee River in the vicinity of Buffalo and Duck Rivers in Humphrey, Houston, Hickman, Dickson and Perry Counties. A fourth trip resulted in the procuring of a number of relics which are to be used in the State Archaeological Museum now being prepared in the Memorial Building at Nashville, Tennessee. There were collected a number of interesting and unusual mound builders' relics and preparations are being made for the installation of these relics in the museum. There has been furnished by the State, a large, commodious room in a fire proof building, well lighted, in which building is located my office as State Archaeologist.

I have endeavored during the year to select and appoint an assistant state archaeologist in every county in the state, but have not succeeded in securing such official for each county but already have a great number appointed who are active in their work.

During the month of March, 1925, I briefly explored some interesting caverns on Obed River, and found evidences of very long occupancy and it was in this field I expected to do extensive work during the year 1925. I did enough work to be satisfied that the people used the caverns both for residential and burial purposes.

P. E. Cox.

Texas. In 1917, the writer was elected to the headship of the old School of Institutional History in the University of Texas, which he accepted with the understanding that this school was to be converted into a School of Anthropology to be conducted after the manner of such departments in the larger universities of the country at large. He at once invited Dr. J. Walter Fewkes to visit him at Austin

and was favored with a visit early in 1919. Dr. Fewkes and the writer reconnoitered together a considerable portion of the Central Texas region for promising places for research. They visited the Round Rock mounds, which had been partially explored already by the writer, and Dr. Fewkes was much impressed with their appearance and promise of revelations of the life of early man in Texas. With various groups of friends, the two visited Gatesville, one hundred miles west of north from Austin, where, in the rich valley of the beautiful clear Leon River, many evidences were found of the presence there, at one time, of a relatively settled primitive population, possessing a higher culture than that evidenced in the burnt rock mounds. Potsherds of a high grade pottery, many manos and metates, one extensive pure shell mound, extensive collections of beautifully chipped arrow points, in private hands, some skeletal remains taken from the sand dunes adjacent to the valley, also in a collection, one rock shelter under which were numerous pot holes or mortars in a ledge of firm limestone, and other evidences of the extensive use of this shelter as a home, were among the things found or seen and examined. Later, San Marcos was visited, and a rock mound, buried largely by deposits of river drift, near Barton Springs in the edge of Austin was inspected.

The outcome of his visit was an arrangement between the Bureau and the Department of Anthropology in the University of Texas for a joint exploration of several of the "burnt rock" kitchen-middens of Central and West Texas, in scattered and representative parts of the regions in which they occur, and for exploration of any other interesting archaeological remains that might be discovered and deemed worth exploring in certain portions of the State.

In pursuance of this agreement, the writer set out to finish a preliminary survey already under way, in order to locate the most promising mounds, camp-sites, etc. and to delimit the immediate field of operation. A questionnaire and circular letter were sent to nearly 10,000 persons in the state. This was done in the late winter of 1918 and early spring of 1919. These were sent to nearly all school principals in the small towns and country districts in the state, to county superintendents of public instruction, to various other county and state officials, and to other citizens.

The questionnaire sought information from the persons addressed as to the existence of anything known to be or supposed to be of Indian origin or to have been particularly related to or used in the former Indian life of the region, such as mounds, burial places,

camp sites, caves and rock shelters once inhabited, rock paintings and inscriptions and collections of artifacts in the hands of private individuals. Finally, the names and addresses of persons interested in such matters and names of old settlers who knew personally the Indians of Texas were asked for. The term "Indian" is naturally applied to all relics of early man known to the present white population and a definite response could be better had from them by using the term in seeking information.

Several hundred of the questionnaires, more or less filled out, and a considerable number of letters were received in response. They came from all sections of the state.

The information thus gathered served to indicate, roughly, the regions in which the burnt rock mounds are to be found; also the region of the funeral mounds, and the regions in which there are no mounds whatever.

Considerable other information was also obtained that will aid materially in future archaeological research throughout the state, such as the location of rock paintings, petroglyphs, caves that might have been used for habitation and of shell mounds, burial places, and collections in private hands.

All information gathered was filed under the names of the 265 counties of the State and has been added too, slowly, by information gathered in field work, from students in the anthropology classes of the University of Texas, from newspapers, from correspondence and from other sources.

This survey is far from complete, but has served fairly well as a rough guide. Information obtained in this promiscuous way, often from wholly unsophisticated sources, would be, necessarily, of very uneven value. Most information concerning the presence of mounds was fairly dependable but some of it turned out to deal with natural eminences. Research work in the Central part of the State has been carried on sufficiently for the succeeding culture periods to begin to appear and to aid in interpreting reports from other parts.

In the Trans-Pecos is a region of low hunter culture involving some cave dwelling. Some crude rock inscriptions are found here, some weaving of nets for the capture of rabbits. This culture merges into Pueblo culture as one goes west and north.

On the Plains and in the limestone regions, extending east from New Mexico to the Balcones Fault line (Dallas-Austin-San Antonio

highway approximately) is the region of the "Burnt rock mounds." These are Kitchen-midden deposits, numerous, extensive, well defined and containing many evidences of a predominately nomad hunter culture. In this region there are almost no signs of pottery, and almost no polished stone but many grades and styles of flint chipping from very crude to some of the most delicate and beautiful in the world.

On the black land prairies, extending from the Balcones Fault to meridian 96°, archaeological remains of any kind are very scarce on the surface. There is a little flint here and no limestone. Few or no springs exist and so there is no special reason why early man should have remained about any one place or have camped repeatedly at the same spot. The soil of this region is clay and the streams carry much silt. This silt covered all remains as they were deposited, so they are rarely concentrated.

East of meridian 96°, the whole region is heavily wooded and is closely assimilated, generally, to the lower Mississippi Valley. Here are numerous earthen mounds often containing burials, much pottery, polished stone, and many evidences of a settled village horticultural life.

Along the coast, cultural remains are scarce. It is here that one would expect to find evidences of migration from the Mississippi Valley to Mexico or *vice versa*. No such evidences have been found in positive form. The surface evidences are largely, and, so far as the writer knows, entirely of the historic culture of this region, which was low. Possibly older and more interesting things are to be found far below the surface, as extensive deposits of silt are thrown down constantly, throughout the low coastal region by the heavy floods to which this region is subject.

The recent discovery of positive, seemingly indisputable, evidences of Pleistocene man on the upper Colorado, in Mitchell County, and in the terraces of the Trinity, at Dallas, have added immensely to the importance of the Texas field. The exploitation of this field will probably go forward much faster in the future. We of the University of Texas will continue to add to and improve our survey as fast as we can. The one thing needful is funds.

In addition to the above, the writer has traveled extensively over the State in auto, visiting nearly all parts, to investigate promising sites for research work and has seen and examined some two or three dozen collections in private hands. Some of these collections

have been gathered over half of a century of time by men who, in some instances, have some knowledge of archaeology. A number of these will have serious value in working out the final interpretations of Texas archaeology.

Finally, research work has been done rather extensively in Central Texas, the results of which will be published sometime soon and which will go a long way to supplement the survey. *J. E. Pearce.*

Wisconsin. Field work was conducted during the year chiefly in the counties of Columbia, Dane, Juneau, Marquette and Jefferson, with scattering investigations and surveys in other counties. Some explorations were conducted in Green Lake county by the Milwaukee Public museum. A fifth addition to "A Record of Wisconsin Antiquities" has been published. Dr. W. G. McLachlan has completed his investigations of the Indian remains of the Lake Kegonsa region and his report has been published by the society.

A group of Indian burial mounds located on the old Assembly grounds at Delavan Lake has been preserved and marked with a tablet. An effigy mound in Devils Lake state park has been restored and a descriptive tablet provided. Mounds now preserved in three Madison parks are to be marked during the present year.

The society has held seven monthly meetings at Milwaukee during 1925. On April 10 and 11 it held a joint meeting with the Wisconsin Academy of Sciences and the Wisconsin Museum's Conference at Oshkosh, and on October 22 and 23 a similar meeting with the Museum's Conference at Green Bay. Here the Brown County Historical Society has marked with wooden and metal tablets many sites of early Indian occupation.

The Hubert M. Jaycox collection of archaeological materials from the Aztalan region, in Jefferson county, has been presented to the museum of the state normal school at Whitewater. The W. W. Gilman collection of Dane county material has been placed in the care of the State Historical museum, at Madison.

During the 1925 summer session of the University of Wisconsin Mr. Charles E. Brown delivered several lectures on local archaeology and conducted the archaeological excursions to sites about the Madison lakes. *Charles E. Brown.*

A. V. KIDDER

ANTHROPOLOGICAL NOTES

Catholic Anthropological Conference

On April 6, 1926 a tentative plan discussed by Fathers Leopoldt, Tibesar (Maryknoll, N. Y.) and John M. Cooper (Catholic University, D. C.) resulted in an organization meeting of the Catholic Anthropological Conference. The general aims set forth are the promotion of ethnological training for candidates for missionary work and of ethnological research and publication by Catholic missionaries.

Various practical problems were discussed, and it was the consensus of opinion that the efforts of the Conference "should not be linked up with any particular university or religious order, but that it should be a missionary enterprise including all orders engaged in missionary work."

The Rt. Rev. Bishop Shahan of the Catholic University was elected President, and Dr. Cooper, Secretary-Treasurer; the Executive Board includes Fathers Muntsch and Tibesar, Msgr. Quinn and Msgr. Hughes. A yearbook was adopted as the immediate means of publication.

The West Texas Historical and Scientific Society has recently been founded at Alpine, Texas. The society is incorporated and has permanent directors. A special room containing six glass cases has been set aside as the beginning of a Museum. Already an excellent start has been made towards the assemblage of a unique and valuable display. The Indian collection is of unusual scientific value, and represents well the aboriginal culture of Western Texas. The Society plans not only to collect specimens but also to record folklore and other ethnological data.

The annual dues of the Society are one dollar. Life membership costs twenty-five dollars. The Museum and offices of the Society are at Sul Ross State Teachers College, Alpine, Texas.

"Human Origins" (in two volumes) by George Grant MacCurdy has been selected by the American Library Association as one of the forty most worth-while books published in the United States during the calendar year 1924. This is part of the plan of the International Committee on Intellectual Coöperation of the League of Nations to select annually 600 outstanding books published in all countries. Forty is the maximum quota for countries publishing 10,000 or more books each year.

B. E. Petri. Professor of Anthropology of the University Irkutsk, Siberia, well known also by his archaeological and palaeontological

investigations in Siberia, is inquiring whether any of the American scientific institutions would be willing to publish some of his material and to help him financially for supplying his work with adequate drawings and plates and for the English translation of his manuscripts. His work on the Siberian Paleolithic, Neolithic, and Metal Ages forms quite a comprehensive treatise. It may be noted that our knowledge of the Siberian Stone Age is quite meagre. Prof. Petri had published in Russian only brief accounts of his studies. Institutions or individuals who may be interested in the above material may enter in direct communication with Prof. Petri. His address is as follows: Professor B. E. Petri, University Irkutsk, Siberia, U. S. S. R. *Waldemar Jochelson.*

DR. HERBERT J. SPINDEN of the Mason-Spinden Expedition to Central America which left last January, arrived in New York on May 23 with a collection of Indian materials from North Honduras and the islands on the coast. *Science*

DR. S. A. BARRETT of the Public Museum of Milwaukee was among the ten men who were awarded the Lapham Medal for notable research in anthropology in Wisconsin by the Wisconsin Archaeological Society at the its silver anniversary. *Science*

Dr. Aleš Hrdlička left on May 17 for Alaska to make a scientific survey of the probable route by which primitive man first reached the American continent. The expedition is under the auspices of the Bureau of American Ethnology.

DR. J. WALTER FEWKES worked during the summer in the Grand Canyon area of Arizona in an effort to preserve the prehistoric dwellings of that region. He concentrated his attention on the Wupatki National Monument near Flagstaff.

At the annual meeting of the Anthropological Society of Washington on April 20 the following officers were elected for the ensuing year: President, Mr. Neil M. Judd; Vice President, Mr. David I. Bushnell, Jr.; Secretary, Dr. John M, Cooper; Treasurer, Mr. Henry B. Collins, Jr.; Mr. Herbert Krieger, Dr. Charles L. B. Anderson, Mr. J. N. B. Hewitt, Dr. Daniel Folkmar, Mr. B. H. Swales were elected councilors.

The Huxley Memorial medal of the Royal Anthropological Institute of Great Britain has been conferred for the year 1927 upon Dr. Aleš Hrdlička who will go to London in November 1927 to deliver the Huxley lecture before the institute and receive the medal.

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